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JANUARY
1954

VOLUME 47
NUMBER 1

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Nature in Print

By HOWARD ZAHNISER

IN THE endless repetitions of nature—in the recurrence of spring, in the lush new growths that replace the old, in the coming of new birds to sing the ancient songs, in the continuity of life and the web of the living—here we find the solid foundation that, on this earth, underlies at once the past, the present, and the future."

So writes Edwin Way Teale in the concluding sentence of his newly published journal selections entitled *Circle of the Seasons*—a sentence and a book that leave a reader joyous with their author's "delight in simple things" and confident with his calm assurance: "There is in nature, a timelessness, a sturdy, undeviating endurance, that induces the conviction that here we have a place to stand." What New Year's note could be better, what more appropriate for January than such journals?

Edwin Way Teale is a person whose journal intimacies are welcome. He sees cedar waxwings catch snowflakes as they fall through the air. He looks at fallen apples, decayed and soggy, lying under the trees; thinks of them as coming to a natural and fitting end by "gently lowering to the soil the seeds they contain," and then reflects: "Decay, rightly understood, can be as beautiful as growth." He awakens at four o'clock in the morning hearing "the copious howlings of a cat fight" and finds himself wondering about the fleas on the fighting cats, thinking of these fleas as "living dangerously amid the flying feet and raking claws and biting teeth and lashing tails, and rolling bodies." He perceives that "a canoe returns some of the buoyancy to life." In the midst of machines he confesses to "vague misgivings" but rejoices, "It is when I am among the old, rooted, growing, living things of nature that I feel most at home."

Circle of the Seasons, comprising 365 notations by this journalist of Nature—accounts of events, descriptions of observations, records of thoughts ("Optimism is more likely if we keep our eyes on the average, the general, rather than the exceptions, the individual.")—is a journal of the year, rather than the journal of a year. Its year is not particularized but composed of the elements that make the round year Edwin Way Teale has come to know as the circle of seasons. It is a year that takes him to the New Jersey coast in May, with his publisher, to edit the manuscript of a new book, in mid-day—but to tramp the shore in the midst of bird migration morning and afternoon. It is a year when he goes to a Thoreau Society meeting in Concord, Massachusetts, on July 12, a year with an August excursion to the Maine woods. It is a year also when he notes the photograph of a riddled straw stack inhabited by English sparrows in *Nature Magazine* for June-July, 1953. It is a year, for the most part, at the Long Island home of Edwin Way and Nellie Teale, where the "Insect Garden" is (and the swamp), where it is not far to the shore, not too far (nor too near) to New York City, where fortunately for us it is a mile's walk for the morning paper. Unfortunately it is not a leap year and we are thus deprived of one more entry that might have been added. For every day in this year is interesting, and all is full of meaning.

Mr. Teale knows that the "instinctive cunning, this unconscious cruelty" of the ichneumon fly—in other words, "the unpleasant"—is "part of the world the naturalist must see." He

declares that "those who walk abroad and see only beauty in nature, only happiness in the singing of birds, only beneficent kindness running through all the natural world—they have never really seen this world at all." Yet the fullness of Mr. Teale's vision is such that looking at the world through his eyes brings one a view that is not dismaying but enticing. There is in his journal a great vitality, an exuberance even. There is wisdom.

If *Circle of the Seasons* can be represented in its richness and variety by a single one of its entries, perhaps that would be in the May 1st paragraphs on "The Dawn of May:"

"Another dawn—serene and honey sweet. At such times, it seems to me that dawn is nine-tenths of the day. Staying up late at night has a sameness about it; but every dawn is different. And this is the dawn of May—May, the month that is never long enough. This is May the first as the first of May should be.

"I saunter along the swamp edge and beside Milburn Pond, where violets bloom. A killdeer circles and calls in the open field behind me. Overhead, I hear the winnowing wings of a mourning dove passing by, and, out among the cattails, a female red-wing plucks fluffly down from one of the weathered heads and flies away. Brilliant green runs across all the tussock tops at the edge of the flooded lowland.

"On such a day as this, it is enough to spend the hours soaking in the sunshine, breathing slowly, sensing to the full all the perfumes of spring. It is enough to delight in the varied shades of green, in the forms of trees and the colors of flowers. On such a day, all our moments out-of-doors are lived in quiet pleasure. I lean against one of the ancient apple trees on my Insect Garden hillside and words I once read on the title page of *The Fisherman's Bedside Book* come back to me: 'The wonder of the world, the beauty and power, the shapes of things, their colors, lights, and shades; these I saw. Look ye also while life lasts.'"

The circle of seasons, the cycle of life, that Edwin Way Teale has perceived was known in surely also by Aldo Leopold, whose perception and valuation of perception were indeed preeminent in his generation. He told as a parable the story of Round River, which Paul Bunyan discovered, "a river that flowed into itself," and he saw in it "the stream of energy which flows out of the soil into plants, thence into animals, thence back into the soil in a never-ending circuit of life." The essay that is this parable he left unpublished when death overtook him half a decade ago, and now his son, Luna B. Leopold, has taken from it the title for the second volume that has posthumously brought us his essays, sketches, and journals. *Round River: From the Journals of Aldo Leopold* is a book that has also been rich in reading with New Year thoughts in mind. Its "circuit of life" is not the "circle of seasons," nor is it the year-round journal that Edwin Way Teale has presented, yet it does, indeed, emphasize that familiar New Year's thought of keeping a daily journal. And it contributes notably to that contemplation of the trend of our living which seems so seasonally appropriate.

Here presented in *Round River* are journals of hunting-camping in the Delta Colorado in 1922, in the wilderness canoe country of the Quetico-Superior region in 1924 and 1925, in the Gila region of New Mexico in 1927 and 1929, in Missouri's Current River country in 1926, and Mexico's Sierra Madre in 1927. Between these journal selections and at the beginning and end of the volume are essays that our editor, Luna B. Leopold, tells us "are taken from more contemplative notes which were in the form of unfinished manuscripts when Aldo died." Two outstanding

Jolly and Jocular

By

JAMES GORDON HEMPBED

With ink to catch the New Year's call,
And paper colored like the snow,
I sing the winter, summer, spring and fall
Thus so!

My winter melancholy sings, "Look
down,"

My vernal hopes, "Look up!"
Dear summer promises a gown,
Fond autumn holds a cup.
All seasons know their rule
As clear as migrant birds,
But I, in one, Time's fool—
How catch the calendar in words?

No almanac for day to day
My verses with the breezes fly.
Unseen, unheard, they steal away
And double-mouthed Janus whispers,
"Why?"

concerns of these "contemplative notes" are the use of leisure time and conservation. Nicely, thus, the volume's journal selections show us Aldo Leopold in action, in the outdoors, at his leisure, while the essays show his great mind perceiving, defining, prescribing.

In *Round River*'s first chapter, entitled "A Man's Leisure Time," Aldo Leopold wrote: "A hobby is a defiance of the contemporary. It is an assertion of those permanent values which the momentary eddies of social evolution have contravened or overlooked." His own leisure time use became more and more related to permanent values. A forester and wildlife manager and a professor of wildlife management, he, of course, found his outdoor hobbies—hunting, fishing, camping, boating, canoeing, and finally ecology in the open—so closely related to his vocational concerns that they each enriched the other, and the result became of great significance to all of us. This was apparent in his earlier, also posthumous, volume entitled *A Sand County Almanac, and Sketches Here and There*. It is strikingly evident likewise in *Round River*, which contains an essay entitled "Conservation" that although brief, has in it texts on which a whole volume could be written.

"Conservation" Aldo Leopold here defines as "a state of harmony between man and land." He suggests that "the outstanding scientific discovery of the twentieth century is not television, or radio, but rather the complexity of the land organism." He finds courage in seeing the "hundreds of young technicians" in the new field of conservation and asks himself hopefully, "Is it possible that science, once seeking only easier ways to live off the land, is now to seek better ways to live with it?"

Round River is an apotheosis of hunting, too, and may well be duly noted as such by both hunters and nonhunters—hunters that they may emulate Leopold as a sportsman, nonhunters that they may perhaps the better understand the mystery of the conservation force that rises from some of those who hunt and fish. One wonders how much Aldo Leopold's concepts of ethics and sport changed as they developed from those days in the 1920's when the *Round River* journals of hunting were written, and it would be interesting to know, also, when he wrote the essays in this volume on "The Deer Swath" and on "Goose Music" with their celebrations of the hunter. In his incisively whimsical manner Aldo describes "four categories of outdoors men" as "deer hunters, duck hunters, bird hunters, and non-hunters," and he says, "The deer hunter habitually watches the next bend; the duck hunter watches the skyline; the bird hunter watches the dog; the non-hunter does not watch." He calls *The Book of Job* "the great hunter's poem." He asks with fervor and fervently answers: "Who painted the first picture on a bone

in the caves of France? A hunter. Who alone in our modern life so thrills to the sight of living beauty that he will endure hunger and thirst and cold to feed his eye upon it? The hunter."

How well favored in attitude and experience Aldo Leopold thus was to become a leader for conservation among sportsmen! He declared that "hawks and owls are a part of the land mechanism" and challenged: "Shall we discard them because they compete with game and poultry?" With his keen perception he boldly pointed out that "the basic issue transcends economics." "The basic question," he said, "is whether a hawkless, owl-less countryside is a livable countryside for Americans with eyes to see and ears to hear." He saw also, in these early years of the 1920's, the fundamental values of wild lands, and with his persuasiveness and sound reasoning so effectively championed wilderness preservation that the Gila area—where the 1927 hunting experiences included in *Round River* occurred—became the "type specimen" of an entire system of wilderness areas established in the national forests.

Joseph Wood Krutch, for another newly issued volume that will provide significant New Year's reading, has the title *The Best of Two Worlds*, quoting Henry Thoreau "as one possessing the advantages of human culture, fresh from the society of men, but turned loose into the woods," and himself adding that Thoreau thus had the best of two worlds. So, as he says himself, has Joseph Wood Krutch, and so has Edwin Way Teale, as well as Aldo Leopold, and so may we all—as these three so well show us. As to Professor Krutch's volume and his comments and their bearings on our perceptions in *Circle of the Seasons* and *Round River*, we have spared ourselves little space for further discussion now, but we do have the promise of another month, and another page, and the thought that not only for January but for all the year these volumes have deep meanings and provocative interests. So off to another month!

Circle of the Seasons: The Journal of a Naturalist's Year. By Edwin Way Teale. New York: Dodd, Mead & Co. 1953. 306 pp. (5½ by 8½ in.) with 23 photographs on 23 plates, 4 symbolic decorative drawings for the seasons on title pages repeated on right-hand pages throughout the book, annotated list of books by Edwin Way Teale, and index. \$1.

Round River: From the Journals of Aldo Leopold. Edited by Luna B. Leopold. New York: Oxford University Press. 1953. 173 pp. (5½ by 8½ in.), with preface by the editor and 26 drawings by Charles W. Schwartz. \$3.

The Best of Two Worlds. By Joseph Wood Krutch. New York: William Sloane Associates. 1953. 171 pp. (5½ by 8½ in.), with 11 chapter-head drawings by Walter Ferro. \$3.

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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and
Devoted to the Practical Conservation of the Great Natural Resources of America

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Golden Nature Guide

Reptiles and Amphibians. By Herbert S. Zim and Hobart M. Smith. New York, 1953. Simon and Schuster. 157 pages. Illustrations of 212 species in full color by James Gordon Irving. \$1.50.

This is the sixth and latest in the excellent Golden Nature Guide series being brought out by this publisher. The format follows the pattern of earlier books in this series, presenting excellent pictures of turtles, lizards, snakes, alligators, crocodiles, frogs, toads and salamanders. With each illustration is brief, popular text and a distribution map for the species. Taking in as much territory as it does, such a book must necessarily deal with only the more common forms, but, like its companion books, it is an excellent introductory identification guide. It should result in allaying prejudice against many of these interesting and often valuable creatures, although as a class they normally intrigue most youngsters anyway, at least until parental misinformation too often directs their attitudes otherwise.

Washington Birds

Birds of Washington State. By Stanley G. Jewett, Walter P. Taylor, William T. Shaw and John W. Aldrich. Seattle, Washington, 1953. The University of Washington Press. 767 pages. Illustrated by 12 color plates, 99 halftones, 51 distribution maps, plus colored life zone map. \$8.00.

More than four hundred and fifty birds are covered in this the first comprehensive book about the birds of our northwestern-most State since 1909. It is the result of a long period of collaboration by four authorities in the field of ornithology, and the publication of this important work is accomplished with the cooperation of the United States Fish and Wildlife Service. A mass of additional data has been assembled since the publication, forty-four years ago, of the classic *Birds of Washington* by Dawson and Bowles. In the interim, also, man has greatly influenced the environment of birds of Washington, beneficially and otherwise. Thus this book was greatly needed and deserves the enthusiastic welcome that no doubt it will enjoy.

By Covered Wagon

Across the Plains in '64. By Anna Dell Clinkinbeard. New York, 1953. Exposition Press, Inc. 97 pages. \$2.50.

When Philura Vanderburgh was thirteen her family crossed the plains by prairie schooner to Oregon. Later, when she had married and had a family of her own, she told the story of her experiences to her daughter, who has now recounted them in this book. The result is a fascinating story of the perils and adventures of the pioneers of ninety years ago. It is also a distinct contribution to our history.

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By Way of Report



Randolph G. Pack

ON THE occasion of the observance of the fiftieth anniversary of the teaching of forestry at the University of Michigan, Randolph Greene Pack, President of the Charles Lathrop Pack Forestry Foundation and Vice-President Emeritus of the American Nature Association, was awarded the honor-

ary degree of Doctor of Science by that University. The citation accompanying the degree reads:

"Industrialist, apostle of conservation. In no measure have the varied and pressing obligations of a successful business career dulled in him the concern for our forests that is characteristic of his family. Constant application to the problems of conservation and active participation in regional and national movements have led him to a considered philosophy of rational land management and have made his voice

one which is heeded in counsel. As president of the forestry foundation which bears the honored name of his father, he has initiated programs of research in which this University has been privileged to participate. We join with all friends of the land in recognizing the merit of one who does not take lightly the responsibilities of citizenship and has served well the common interest and the public good."

VOTERS in New York State voted in favor of Amendment No. 9 to the State Constitution, which now throws adequate protection around the Adirondack Forest Preserve. The American Nature Association joined with other conservation organizations in support of this amendment. Members of the Association in New York State were sent a special appeal to help ratify this amendment, and to influence others to do so. We have received evidence that they did, for the president of the New York State Conservation Council writes thanking us for "the grand support and wonderful work" in connection with this campaign.

RICHARD W. WESTWOOD, President of the Association, recently visited the Association's Arizona-Sonora Desert Museum at Tucson, finding it widely popular in the Southwest and promising an outstanding future as a desert research center. Mr. Westwood also addressed the annual convention of the American Humane Association in Denver, and his address is published in the November, 1953, issue of the *National Humane Review*.

Membership Application Blank

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WASHINGTON, D. C.

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Contents Noted

WHEN Howard Zahniser, editor of *The Living Wilderness*, official publication of The Wilderness Society, devoted the entire Summer, 1953, issue of that magazine to discussion of "Wild Country as A National Asset" by Olaus J. Murie, it was not with the thought that he would be creating a conservation "best seller." Dr. Murie, president of the Society, delivered a series of three Isaac Hillman Lectures at Pacific University in Forest Grove, Oregon, last April. They were all devoted to consideration of the subject quoted above, and they constituted perhaps the finest, most comprehensive, and most carefully thought out presentation of wilderness philosophy yet voiced. The first run of the magazine was quickly exhausted and it was necessary to go back on the presses to supply the demand. One order for ten thousand reprints of the issue was received and filled, and requests for copies continue steadily. This is a most encouraging reaction. Fifty cents to The Wilderness Society, 2144 P Street, N. W., Washington 7, D.C., will bring a copy of the magazine and provide the purchaser with a truly classic and deeply inspiring discussion of the place of wilderness in American life.

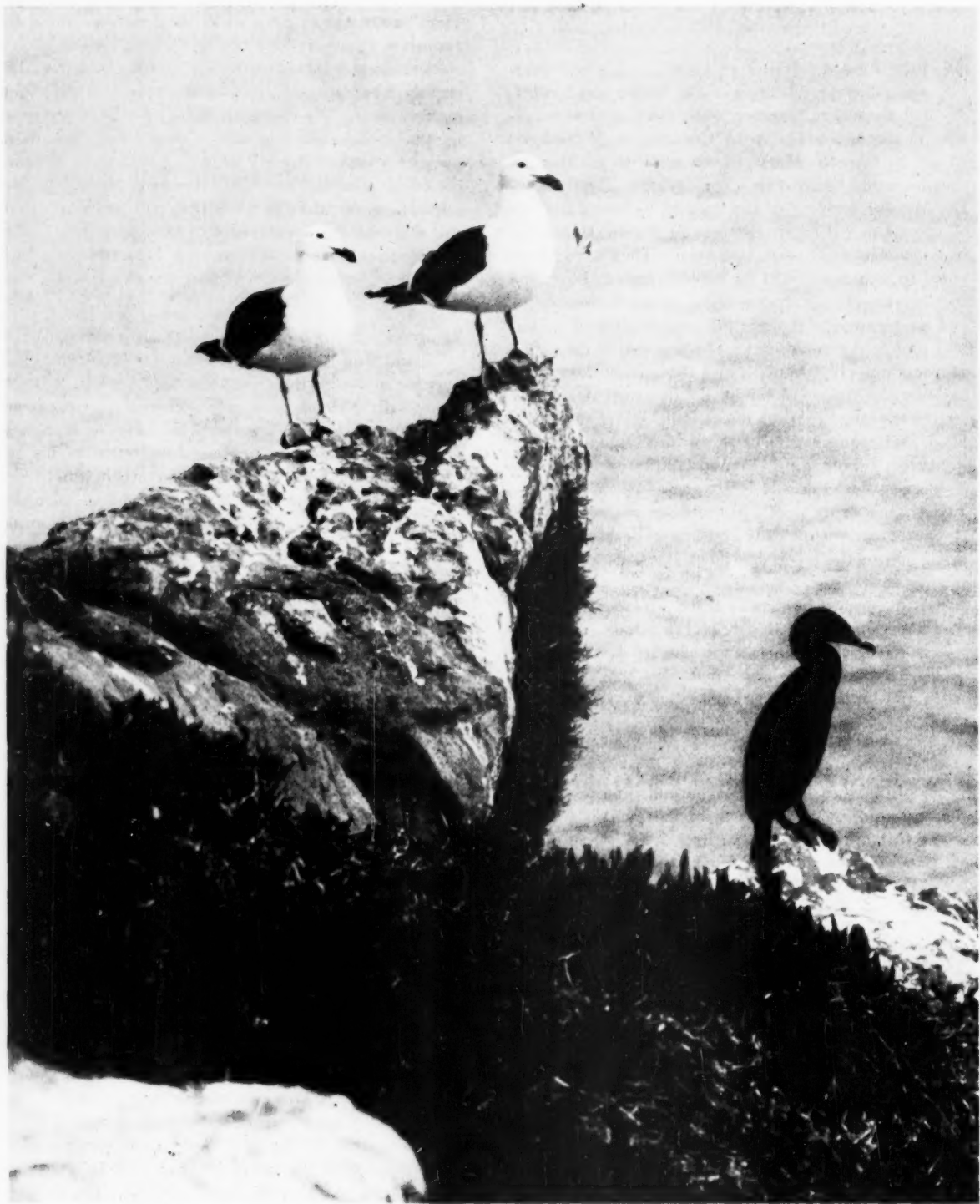
POSSIBLY some residents of the sovereign State of Illinois have considered as gratuitous occasional assertion here that Illinois is a backward State so far as wildlife conservation is concerned. We believe that we are amply supported in our conviction by the action of the Illinois Legislature, in 1953, in twice rejecting legislation that would take the State Department of Conservation out of politics, and place it under a bipartisan board of individuals interested in and informed about conservation. As it is now, the department is a source of political patronage. As much as eighty percent of its personnel is dismissed every four years under this system. Obviously little in the way of a long-range conservation program can be put into effect, and little or no conservation morale can be established. Organized sportsmen in the State have fought for a non-political administration, thus far without avail. The continued intransigence of the Legislature, particularly the Senate, is costly to the wildlife resources of Illinois, and inimical to their sound administration on the scientific basis, now an accepted part of modern conservation thinking.

AS WE went to press with this issue of the magazine, active controversy was still raging with respect to the so-called "Benson Plan" for the reorganization of the United States Department of Agriculture, particularly so far as the future of the Soil Conservation Service is concerned. In the eighteen years since it was actually activated, this Service has made a notable contribution to application of practices calculated to conserve and restore our grazing and crop lands. It has built up a corps of trained specialists, operating largely

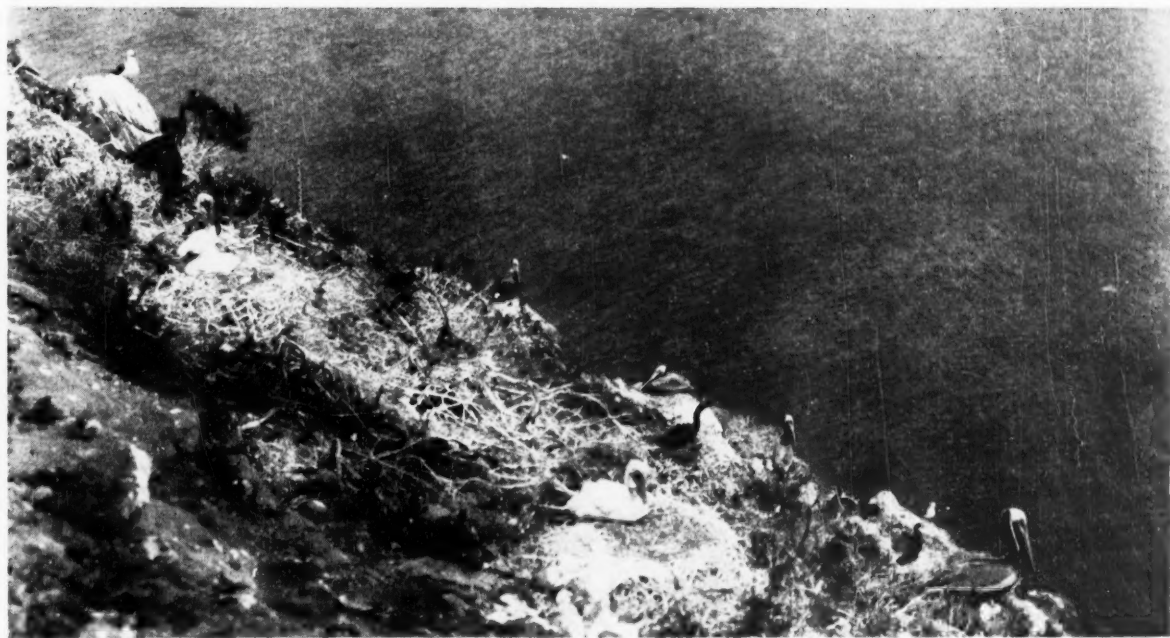
through regions, to aid the landowner in applying the best policies of soil management. Under the "Benson Plan," as it was at press time, these regions would be abolished. Such services as would be salvaged from this change would be placed on a State basis, although under exactly what auspices, and to what an extent, is not entirely clear. We confess that we have been confused by the considerable amount of double-talk attendant upon this issue. Nor do we regard ourselves as competent to prescribe just what should be done. We do know, however, that we heartily oppose any move that will diminish the opportunity of the Soil Conservation Service to provide the maximum of leadership in assuring and enlarging a policy of wise use of our soil.

"CONSERVATION is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left," writes Aldo Leopold in *Round River*, a posthumously published collection of his essays, which book is reviewed elsewhere in this issue. Dr. Leopold continues: "The outstanding scientific discovery of the twentieth century is not television, or radio, but rather the complexity of the land organism. Only those who know the most about it can appreciate how little we know about it. The last word in ignorance is the man who says of an animal or plant: 'What good is it?' If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering."

SPARKPLUGGED by the National Council of State Garden Clubs, a nation-wide campaign is being waged against "litterbugs." Many groups, including civic and conservation organizations, are cooperating to crusade for clean and attractive roadsides and against vandalism and outdoor bad manners. In at least two States the outdoor advertising interests have been quick to realize that the rural highway billboard litters the environment of the highway. And they have been equally alert to both divert attention from that fact and to place crusaders against litter under obligation to the industry. This is achieved through the offer of free billboard space to further the campaign. Letters in appreciation of this free space are then a weapon against public regulation of billboards. The crusaders have fallen for this dodge here and there. The General Outdoor Advertising Association of America urges its members to seek good will in this fashion, and "to spotlight the public-spirited cooperation of your medium, and help bring about a realization of your support of worthy projects." *Timeo danusset dona ferentes*—which means, freely, "Fear The Greeks Bearing Gifts." R.W.W.



Sentinels of the Coronados.
Two western gulls and a lone
Farallon cormorant pose on a
rocky eminence of one of the
islands set in the blue Pacific
within sight of the city of
San Diego.



Nests of California brown pelicans and Farallon cormorants on the Coronado Islands. Note the white phase of the young pelicans. The nests of the cormorants are constructed of sticks, like those of the pelicans, but are smaller and more compact.

Los Coronados, Deserts in An Ocean

By MARGARET M. THORNBURGH

Photographs from the San Diego Museum of Natural History

SEVENTEEN miles from San Diego, as a sea bird flies, lie the Coronado Islands, the only land between the southwestern corner of the United States and the horizon. Although they are near a great population center, and a familiar part of the skyline for thousands of San Diego residents and tourists, we could *almost* write, as their discoverers did more than four hundred years ago: "These islands are uninhabited except by sea fowl and creatures of the sea, and from all evidence, never have been inhabited."

Early explorers touched here, but they did not tarry. These are true desert islands with no fresh water except the moisture brought by rain and fog, and for the most part man has passed them by. Flying the Spanish flag, the Portuguese, Cabrillo, discovered them in 1542. It was sixty years before the next white man, his countryman Vizcaíno, sailed this way. Vancouver saw them on his long voyage to the north; Dana must have observed their rugged outlines when he lived and worked by San Diego Bay. They were charted, mentioned in diaries, and drawn on maps. When the international boundary was fixed on the mainland, these dots of land offshore were kept by Mexico.

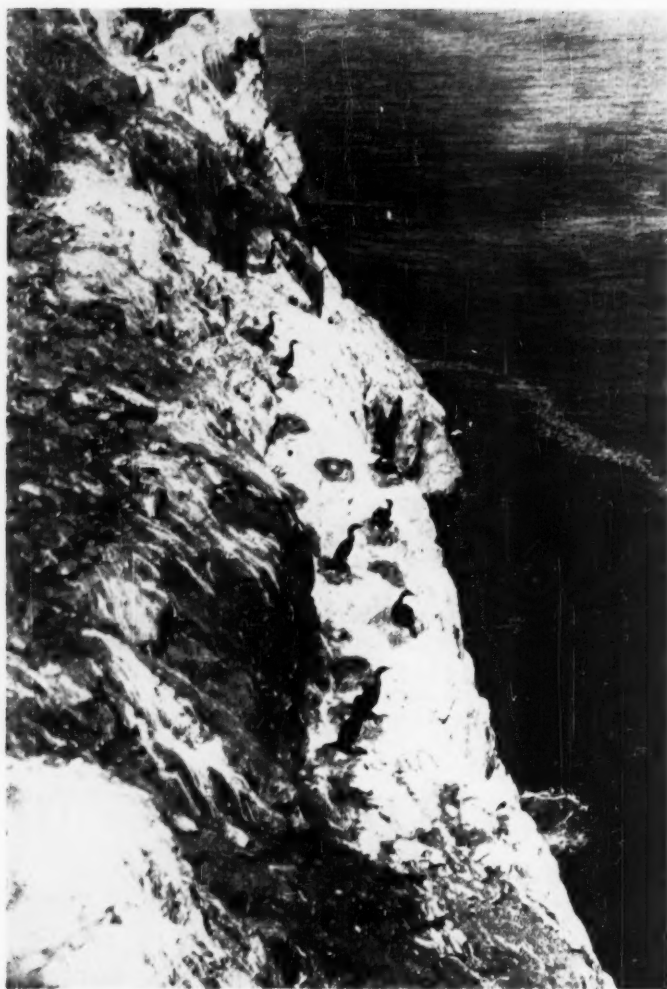
Today Los Coronados are landmarks for fishermen, and for the sailors aboard carriers and destroyers re-

turning across the Pacific to their home port. The waters nearby are a favorite territory for the sports-fishing boats, but seldom does anyone set foot ashore.

For the naturalist who has obtained his Mexican permit to land, the four islands can offer a worthwhile experience. The southernmost island, although the largest, has less of interest, with the notable exception of its elephant seals. It has a full quota of rattlesnakes and rodents, and little of other resident animal life. Here Mexico maintains a lighthouse, and at times stations a few soldiers. Cats and goats, brought by lighthouse keepers, have long since disrupted the natural balance.

The two center islands are jutting points of rock, much faulted and pounded by the sea.

It is the northern island that is most interesting. It harbors no rattlers, and is a haven and nesting ground for sea birds. From a small boat it appears a formidable terrain. The sandstone cliffs, rising sheer from the restless water, provide only one short strip of shore line where landing is feasible. It is on a curve of the lee side, sheltered from the prevailing westerly winds. Here the smooth water brings a startling sensation of unexpected blessing, like consciousness of a little miracle, as the boat glides across it, suddenly calm and



Colony of Brandt cormorants nesting on Coronado island cliffs, which rise almost perpendicularly from the sea.

island and the two very small ones are ringed by white surf. Around this northernmost island the brown seaweed makes swaying patterns of ceaseless motion near the land. Across the expanse of blue the Mexican coast recedes, and San Diego is an alabaster city in the distance.

Much of the land surface is bare ground or rock. There are low-growing bushes but no trees. A mesembryanthemum, serving effectively to hold the scant soil, covers many areas. It is an attractive variety with red-streaked leaves, and its small pink blossoms, incongruously dainty, are a note of delicacy in an overwhelmingly rugged setting. The various cactuses bear their ornaments, too, exhibiting the yellow to peach shades of a flowering prickly pear, and the smaller green blooms of the golden-spined cereus. Persisting through wind, scorching sun, and searing drought, with a fragile look, even a slight fragrance, these flowers provide an inconsistent accent in a place that is the epitome of harshness.

It is in May, during the nesting season, that the island sustains its peak population. Nests of the western gulls are located in what seems to be every available spot, and as the human intruder walks and climbs over the accessible land area the colonies of birds take to the air with a clamor that will not subside as long as the alien menace is present. The circling, diving, screaming gulls protest the invasion. Nest building appears reduced to a minimum, since each nest consists simply of a slight, rounded depression that is enough to prevent the eggs from rolling away.

An occasional nest site will have a few dried wisps of grass around it, like a touch of frivolity or decoration, or like a symbolic concession to more conventional building. Both the eggs and downy chicks of the gulls are a dark greenish-gray, marked with spots of dark brown, a camouflage that neatly matches the ground colors.

Nests of the gregarious brown pelican, first encountered about half way up the slope, are found all the way to the crest, and the whole length of the island. Fashioned of sticks, there are usually several nests together, making a little community. Some are constructed on the ground, some are set into the tops of low bushes, and some are half and half, that is, one side on the ground and the other, such is the angle of the hillside, in the top of a bush. This last is a strategy, certainly, accomplishing a level nest with considerably less effort than building one side higher with more and more sticks!

Pelicans in all stages of development, if creatures so

quiet after the rocking swells and buffeting air of the open sea.

The shallow depth of this minute bay makes it possible, when the tide is low and the surface is unruffled, to look into another world—the submarine gardens where the near-white sand of the bottom sets off all the weird forms above it. There are the bulbous, floating fronds of kelp, olive-brown stalks waving gracefully; the unfading, brilliant green of the long eel grass undulating with the rhythm of the sea; small fish idling, then darting like lightning for no reason that a human eye can detect; and highlights of moving, tropical color, the orange-gold of many Garibaldi perch.

The island is precipitous, both east and west slopes rising steeply, at times perpendicularly, almost five hundred feet to the narrow, bony ridge that extends the island's one mile length. From the flat shelves of rock where a boat can land, it is possible to walk north for some distance near the shore. The climb to the top is easiest just above the landing place, but slow because of the steepness and the loose rocks, as well as the less conspicuous cactus. From the crest, colorful views reward the difficult ascent. To the south the largest

California sea lions sprawl on the rocky ledges and promontories, or play in the fierce surf of the island's windward side.



prehistoric looking can be called developed, are in evidence. The newly hatched young are like grotesque caricatures, quite on the purplish side. The gaping bills seem to bespeak eternal hunger, and emit an almost constant plaint that bears an uncanny resemblance to the crying of a new-born human infant. The pelicans go through a white phase before beginning to acquire the dark plumage of maturity. They are

heavy bodied, and able to get about on their large feet for some time before wings have sufficient strength for their balanced flight and plummeting dives. The phenomenal pouch, which will scoop and capture many a fish before the summer is over, appears a thin and delicate membrane on the younger birds.

The ubiquitous cormorants, with their shining green eyes, have found this stony retreat to their liking. They perch on the cliffs, black and glistening, like lengthened distortions of themselves. When flying, with snakelike necks extended, their rapid, powerful wingbeat may take them far. Resting on the water, they suddenly leap forward in a dive and disappear. Swimming with wings and feet, they are as swift and agile as a fish in its own element, and go to great depths

in search of food. Their nests, of sticks like the pelicans', are smaller and more compact, with the added refinement of a lining of eel grass, which they dive to pluck from the ocean floor. When nests of cormorants and pelicans are adjacent, the young make a great fuss and noise in argument, thrusting out their heads and necks at each other, but exchanging no blows.

In this marine situation one familiar land bird is represented as a permanent and fairly abundant resident. Song sparrows seem to belong properly in a riparian association, in the willow thickets, cattail marshes, and tule beds so far removed from the aridity of the Coronados. Here the ecology is extremely different, but the low vegetation and sparse brush cover, and the tangles of grass clumps, intermingled with cactus, supply the necessary shelter and nest locations above ground. Condensation from fog provides the moisture required by birds of this type. They have been isolated so long, have become so well adapted to the dry conditions, that a difference in color is quite apparent. Paler than forms existing in more humid regions, with much less contrast in stripes and background colors than the song sparrows of the nearest mainland, they blend perfectly into the brown and gray of the weathered island sandstone.

Strangest of all are the oceanic birds, the murrelets, auklets, and black petrels, whose true habitat is the limitless expanse of open ocean. The chunky little murrelets, studies in white and shades of gray and black, have a



Young Farallon cormorants. Note the colored pouch and the powerful, webbed feet so well equipped for swimming.

soft and silky look that contrasts markedly with the hard-surfaced appearance of many water birds. When alarmed by danger they always fly out to sea, disappearing into space. The petrels, smallest of birds that live far from land, have amazing powers of flight. The curious derivation of their name is Biblical, from an allusion of Matthew's to St. Peter, and comes from their odd custom of "walking" on the water, as they patter with feet over the waves while remaining on the wing.

Foraging the surface of the sea, and thus infrequently seen by man, these birds, like the albatross, became a part of sea-lore and the superstitions of sailors. Independent of land for most of the year, they resort to a terrestrial life only at this season. Using the island for their nests, which are built in crevices, or in holes and burrows far back among the rocks, they are never seen on the Coronados during the hours of light. All activity, all sounds of voices

and feeding of young are confined to night. Complete silence through the day makes the underground colony apparently nonexistent. After dusk, when they emerge in vast numbers, the dark, twittering forms dart about like aerial dervishes in a frenzied dance.

On the towering cliff that forms the northern point of the island, live a pair of duck hawks, typifying this uncompromising place of rock and waves and air more than any of the other forms existing on the islands. From their high point they make forays among the sea birds, traveling with marvelous swiftness on their long, pointed wings. To their victims they must be the embodiment of terror, coming always at great speed to capture their prey on the wing, and carrying it to their perch in vise-like talons. Taking their daily toll, these falcons exemplify, in this limited world, predators that serve as a check and counterbalance in the natural scheme.

California sea lions, brown and sleek, can always be



Narrow, flat shelves of rock on the lee side of the northern island provide the only feasible landing place. Submarine gardens can be seen in the depths of this small bay. The climb to the heights above is rewarded by remarkably beautiful views.

found near the islands, playing in the fierce surf or sprawling on the rocky promontories of the windward side. These are the unique animals that comprise all the "trained seal" acts of the world's zoos and circuses.

Once there were fur seals here, but, like the sea otter and elephant seal, they were exterminated by the brutal weapons of the last century's fur and oil hunters. Now the elephant seals are coming back. Under the protection of the Mexican government the two and one-half ton animals are occasionally found offshore, and in the last three years the nucleus of a new colony has located on the west shore of the south island.

Back again from oblivion are the gray whales, once also thought extinct along our Pacific coast. They pass the islands, feeding along the kelp jungles, as they migrate in winter to the bays of Baja California to bear their young, and again as they go north in the late spring.

A small, white-footed mouse, kangaroo-like, is the only land mammal living on this north island. Its habits conform to the necessities of survival, so it is nocturnal and inconspicuous, and as a species has successfully kept away from ravenous birds.

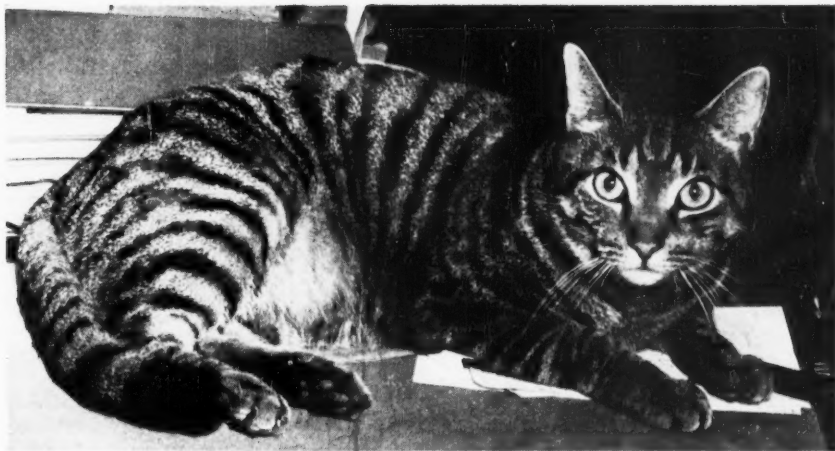
Long ago the resident life became adjusted to insular reality. Any of these creatures that spend a part of their lives elsewhere must be able to live on the water, or fly long distances over it, or to swim successfully through the changing currents and fluctuating tides that separate the islands from other land. The living things in this microcosm have obviously survived because they are resilient and tough. Their vulnerable and weak relatives became extinct centuries ago, if indeed they were ever here at all. The triumphant species have sharp spines, or armored scales, or devastating beaks, or powerful talons, or powerful wings. Each is perfectly adapted to what is here; adjusted to the elemental existence of a desert in an ocean.

February Rain

A muted octave
Stretched across the mountains,
A soft note sliding

By GILEAN DOUGLAS

Down the scale of trees,
While bare rocks shine
And the trails are dark with promise.



PHOTOGRAPH BY H. J. FIELDS, COURTESY OF "THE VILLAGER"

Tiger Cat— Heir Apparent of the Nile

By HOPE SATTERTHWAITE JEN

"**G**OD created the cat to give man the pleasure of caressing the tiger." When Méry turned that famous phrase he was doubtless thinking of the cat species as a whole. And down the years, from days of remote antiquity, mankind has continued, for one reason or another, to enjoy this pleasure.

Fashions in cats change, however, no less than in breeds of dogs or woman's dress. And the cat that in pattern of marking, and even in popular name, most closely emulates the denizen of Bengal forests has been more or less shelved. Nowadays people boast of possessing a Siamese or a Persian, a silver tabby or a blue-eyed white. But, if a cat can claim the oldest feline color pattern of them all, he is apt to be disparagingly described as "just an ordinary tiger cat." Even cat clubs shrug him off, refusing official recognition to this most ancient of breeds.

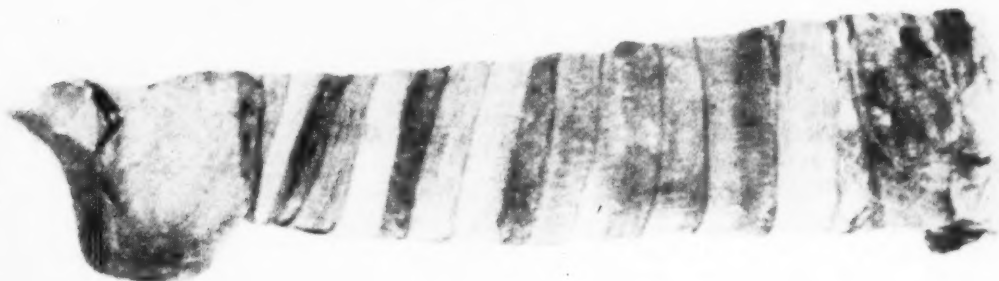
Why should this be? Perhaps it is because he clings so tenaciously to his heritage that its antiquity is not

fully realized. Yet surely he should receive his share of honor—this direct descendant of Nile legend, companion of Cleopatra, pride of the early Pharaohs.

The earliest domesticated cats sprang from the wild Kaffir cat of northern Africa. And, one and all, they bore the tiger markings. Their pictures have been found on the walls of the tombs of the Pharaohs. Long-legged, lithe and rangy, they already had captured the distinctive grace that sets apart all members of the cat tribe. Except for his larger ears, one of them, encountered on the street today, might easily be mistaken for the neighbor's tiger tom cat. The place they occupied in popular esteem was, however, far higher than that usually accorded the average feline member of present-day communities. For the Egyptian cat was revered as sacred.

Human life might be cheap in ancient Egypt, slaves might be sacrificed or slain in a gust of anger, but for him who killed or harmed a cat the penalty was heavy.

Hundreds of mummies of tiger cats have been found in Egyptian tombs, some decked with gold and gems. The photograph below is of one such mummy in the collection of the Brooklyn Museum.





A bronze coffin for two Egyptian kittens, the coffin adorned with two representations of the deceased. This is in the collection of the Brooklyn Museum.

Bast, the cat goddess, worshipped as the "lady of life," had her own magnificent temple at Bubastis on the banks of the Nile. Her feast day called forth flotillas of revelers, the high point being a sumptuous banquet at Bubastis. On their death, pet cats were mummified and, if their owners could afford it, decked with gold and gems. Hundreds of these little mummies have been found at the site of their patron's temple. And they were tiger cats.

How did this ancient pet of the Egyptians extend his range to the rest of the civilized world and set his stamp on present-day descendants in London and New York, Vancouver and Bombay?

Phoenician traders, plus the cat's own love for adventure, his inborn tendency to roam, probably accounted for his earliest migrations. Then, as navigation expanded, as men of many lands took to the sea, down the centuries, the cat accompanied them. He made his home on many foreign shores and impressed his tiger stamp, to greater or less degree, on the feline population of future generations.

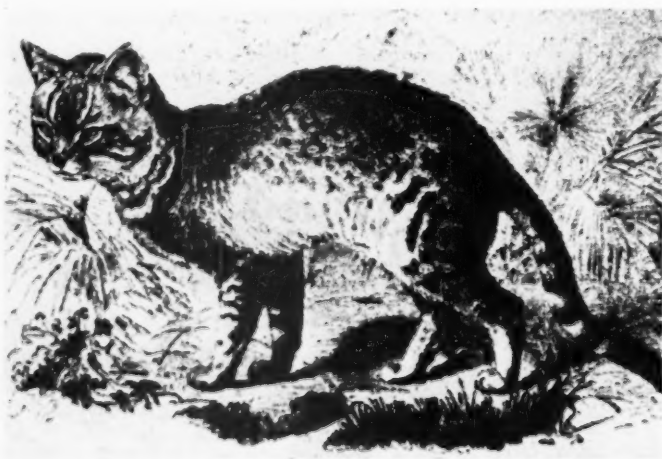
How did the many different breeds and color patterns spring from this tiger heritage? They did so because it is but one strain, although a dominant one, in an intricate mixture of races. Racially speaking, the cat is no purist. Given the chance, he will mate eagerly with other feline species. That, through the years, these matings produced fertile offspring is attested to by the varied forms and colors of the cat's descendants.

In his northerly wanderings the cat from Egypt undoubtedly met the European wild cat, a thick-haired, bushy-tailed creature, marked not unlike himself. And as he journeyed southward and to the Orient he found various snall, sandy and spotted wild species. The blood of these natives eventually mingled

with his own. Today's Siamese, for example, is believed to be a mutant, that is a sudden, sharp change in biological type, from the ancestral breed. The late R. I. Pocock has declared that through faint spots the Siamese shows his tiger heritage. And I myself once saw a Siamese kitten of pure breeding, who, unlike his brothers and sisters, bore a shadowy suggestion of tiger striping. As for Persians and Angoras, the ultimate origin of their long coat remains obscure, but they, too, can claim striped heritage, their colors duplicating those of their short-haired cousins.

The tiger cat is known, in breeders' parlance, as the striped or lined tabby, depending on the width of the vertical bars that mark his body. The narrower, lined pattern is believed to be the older. There is another tabby pattern, the blotched or marbled, in which the banding on the body forms swirls rather than vertical stripes or lines. This blotched pattern is conceded to be younger than the ancient tiger striping, having arisen as a mutant or from crossing long years ago with some unknown wild species. The interesting point is that these two patterns never mingle. Even in the same litter there may be striped kittens and blotched kittens, but never a kitten whose body shows both forms of marking. And fashion dictates that the striped kitten, showing the ancient heritage from Egypt, is entitled to no show standing, whereas his blotched brother may compete in classes for brown tabby, red tabby, or silver tabby, depending on his background color.

Although his roving nature may be blamed for the wide variations in feline types bequeathed to us by the erstwhile idol of the Pharaohs, credit for the finer distinctions of modern breeds must go to the present-day cat breeder. As with the dog of today's civilized world,



The earliest domesticated cats sprang from the wild Kaffir cat of northern Africa, and they all bore the tiger markings.

the cat has been brought to a point of refinement offering a type to meet every taste. In color, the range of choice is wide—blue-eyed white, coal black with eyes of glowing orange, the Siamese pattern, light cream, deep red, pale lavender, tortoise-shell—bred for clean-cut color contrast to the very tip of the nose, silver and its shadings, blotched tabby against brown, red or silver background, even smoke. And, as in the case of bulldog and greyhound, St. Bernard and Chihuahua, such results reflect long and painstaking effort.

But, in spite of all professional efforts, even in breeding for solid color, the Egyptian granddaddy of all domestic feline breeds frequently declares his presence. It may appear in faint tiger stripings on young, solid-color kittens, stripings that fade as the kittens grow. In my own household we had a kitten who later grew to be one of the finest orange-eyed solid blacks I have ever seen. In his infant days, however, his fuzzy baby coat bore tiger tracings, visible under strong light.

Second Blossoming

The thorny pyracantha flamed,
Branches weighted to the ground
With crimson berries swiftly claimed
By clinging towhees, banquet-bound.

Stars of the Prairies

By RALPH J. DONAHUE

AMONG the late summer flowers that grow wild in the central States, the various species of the *Laitris* make good showing, with hues varying from almost white to a rosy purple. Lovers of the dry prairie soil, these plants grow a yard or more in height from a bulb-like rootstick about the size of a large hickory nut. The basal leaves are much wider and longer than those that appear higher up the stalk. In the case of the cattail gayfeather, *Laitris pycnostachya*, these upper leaves are so slender and numerous as to remind one of the needles of pines, while the lower leaves are spatula-like, an inch wide and several inches long.

With the blazing star, *L. scariosa*, the upper leaves are fewer in number and shorter. Also there is a difference in flower arrangement. With the gayfeather the blooms are so closely packed together on the upper stalk that their combined effect is that of a pinkish-purple cattail. The button snakeroot, which is another name for the blazing star, on the other hand, spaces its flower clusters farther apart, and the unopened "buds" bear a striking resemblance to certain old time dress buttons of a wine-purple color. Some have suggested these unopened flowers look like little red cabbages on the stalk! Representatives of this genus are found from Minnesota to Florida, west to Texas, Nebraska and Manitoba.

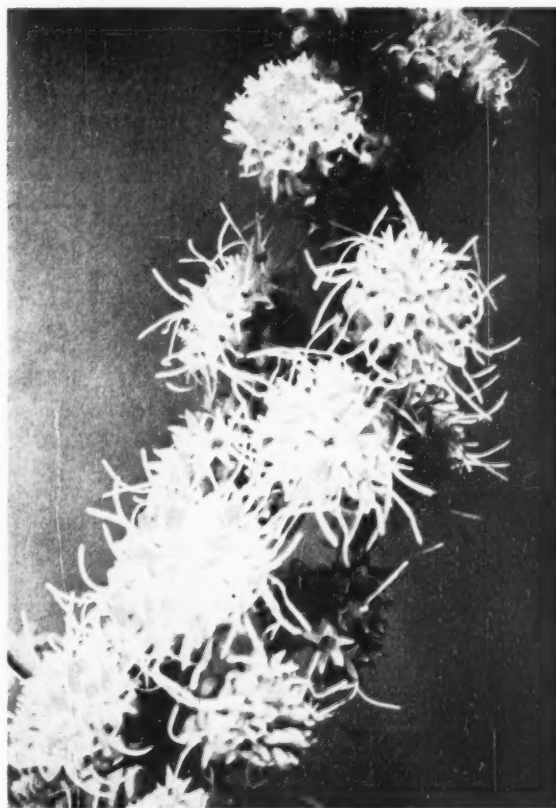
FOR JANUARY, 1954

Vertical stripes distinguish the tiger cat. But he bears other "trade marks;" "trade marks" shared by his blotched cousin. He is adorned with necklaces and bracelets of dark color, and dark rings circle his tail, while on his forehead, etched in black, the letter "M" invariably appears. This "M" can be found in various wild feline species from the highlands of Scotland to the jungles of Borneo.

Fortunately for his admirers—and, regardless of the decree of fashion, he is not without them—the tiger cat shows no signs of dying out. He can be found sunning himself on country doorstep or metropolitan back fence. Cherished member of many households, he also lends his tenacious vitality to the less fortunate feline strays who eke out a precarious existence in communities from here to Zanzibar. And, with his proud heritage, he doubtless will be on the scene in the not impossible days when fashion calls for cats with wiry coats or the curly tails of pug dogs.

By ETHEL JACOBSON

Each bough swayed lower than before,
Stripped by elate despoiling herds,
But lovelier in the grace it wore
Blossoming afresh in birds.



Blooms of the blazing star, *Laitris scariosa*, also known as button snakeroot.



PHOTOGRAPH COURTESY THE AMERICAN GEOGRAPHICAL SOCIETY

The Andean Indians thresh the quinoa by flailing, separating the chaff by winnowing. Threshing is done after the cut plants dry several days in the sun.

Staff of Life—Peruvian Style

By ELSIE A. PARRY

THE Peruvian Indian woman in the market at Pisac looked up at me without expression from beneath her broad, colorful hat. Perhaps she was wondering what on earth this strange, hatless white woman wanted with two double handfuls of quinoa. She may well have wondered. Certainly it could not have occurred to her that these tiny seeds, so commonplace in every Indian household, were destined to travel more than eight thousand miles and end up in a New York kitchen.

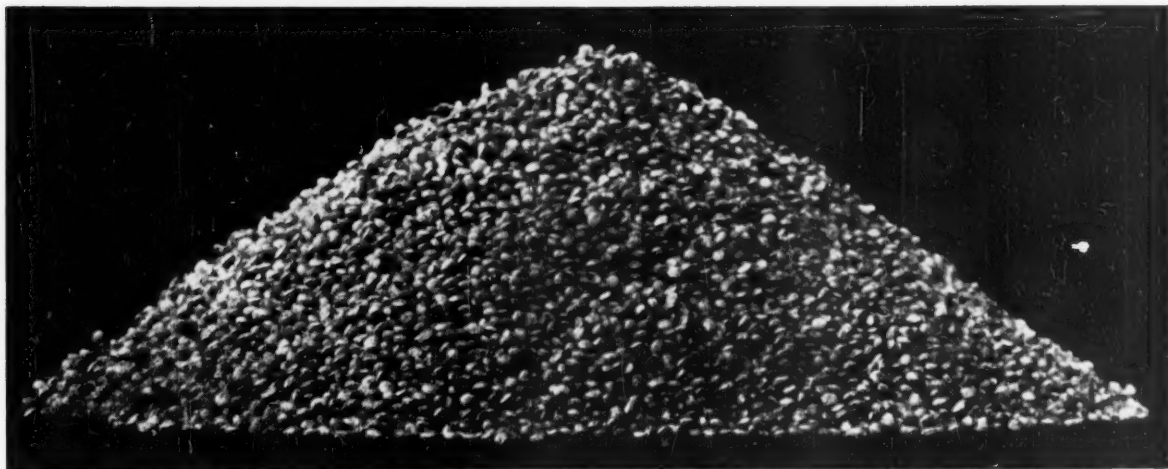
I scooped the seeds into a bandanna and gave the market woman the few coppers she asked in payment. For about three cents, U.S., I had purchased a bit of Inca history dating back, without interruption, to pre-Conquest days.

There is little in a quinoa seed to fire the imagination. In size it resembles a mustard seed slightly flattened, its color is indeterminate between dirty white and reddish-brown, and its taste, raw, has little to recommend it. But quinoa, for all its apparent insignificance, has

well been called "the chief nourishment of the people" in the high Andes of South America. It was a staple food of the natives when Pizarro and his marauders arrived in 1527, and it has been found, still fertile, in prehistoric graves.

Botanists call this grain by the scientific name *Chenopodium quinoa*, and put it in the goosefoot family, a cousin, of our common pigweed or amaranth. Incan arrow is one of its nicknames, but its old native name, *quinoa*, has basic significance—it means *mama*. The ancient Indians of Peru, believing that all economic plants are animated by a divine being who influences growth, worshipped the quinoa-mother in an image made of leaves.

The average layman would doubtless describe *Chenopodium quinoa* in one scornful word—weed. It stands three to five feet tall with triangular leaves not unlike those of a mallow, a stout, furrowed, and much-angled stem, inconspicuous flowers, and a multitude of tiny, vari-colored seeds. It is certainly no ornament to a



PHOTOGRAPH FROM NEW YORK BOTANICAL GARDEN

A little mound of quinoa seeds, which resemble a mustard seed in size, their color indeterminate between dirty white and reddish-brown. Here a little larger than natural size.

garden and thus has found no favor for this use.

But quinoa has virtues beyond mere beauty. It thrives where no ordinary garden plant could live out its life cycle. In the cold, thin atmosphere of the 12-15,000 foot altitude belt (where neither wheat nor barley will ripen), often in the poorest sort of soil and with little or no care, this herbaceous annual is exceedingly prolific. Without it the high Andean native diet would be poor indeed.

No one knows, of course, who among the ancient Incas first sampled quinoa. He (or she) found the young shoots tender and palatable as "greens" and the seeds slightly glutinous but nourishing and of acceptable flavor. To modern taste the seeds are reminiscent of buckwheat, with a touch of pea-flavor. In addition to its food value, the plant was found to have certain medicinal properties, highly esteemed by the witch-doctors in the practice of their trade. Moreover, the dried stems of quinoa make a quick hot fire. This was, and still is, vitally important in a land where fuel of any sort is hard to come by, and the dearth of oxygen hampers fire-building.

Because the pre-Conquest Indians had no written lan-

guage, the task of recording their life and times fell to their conquerors. Fortunately, some of the Spaniards were articulate as well as observant, and they carefully set down the habits of these strange Andean people.

One of the chroniclers was Antonio de Ulloa. In his *Voyage to South America* (1743) he describes quinoa with a careful attention to detail:

"Quinoa is deserving to be ranked among the most palatable foods; but still more valuable for its being one of the preservatives against all kinds of abscesses. . . . This useful species of grain (here called quinoa and by the Spaniards *mujó* or lesser rice) resembles a lentil in shape but much less. When boiled it opens and out of it comes a spiral fibre which appears like a small worm, but whiter than the husk. It is an annual plant, being sowed and reaped every year. . . .

"The quinoa is eaten boiled like rice and has a very pleasant taste and the water in which it has been boiled is often used as an apozem (decoction).

"The quinoa is used in external application in order to which it is ground and boiled to a proper consistence, and applied to the part affected, from which it soon extracts all corrupt humours occasioned



Picture of quinoa from *Curtis's Botanical Magazine* of 1839. Smaller drawings show (1) the flower; (2) the open flower; (3) the fruit and perianth; (4) the fruit magnified.

The market place in Pisac, where the author purchased quinoa seeds to bring home to New York to try out as food.

PHOTOGRAPH FROM PANAGRA

by a contusion. . ."

Garcilaso de la Vega, who claimed Inca descent through his Peruvian mother, remarks, in his *Comentarios Reales* (1608), that the Incas "sowed a seed like rice with the maize, called quinoa, which is also raised in the cold lands. . . . Both the Indians and Spaniards eat the tender leaf in their dishes because they are savoury and very wholesome. They also eat the grain in their soups. . . They also make a beverage of the quinoa (chicha de quinoa) but only in districts where maize will not grow."

By 1786 the ancient highland plant had become very popular, even in low-lying Lima. Quinoa gruel was seasoned in various ways, chiefly by the addition of pimento. In another method of preparation, called *carapulque*, the seeds were lightly toasted like coffee, strained, and boiled in water, yielding a "brown-coloured *bouillie*."

It is a matter of remark that the Incas did not make breadstuff from quinoa—nothing resembling the Mexi-



can tortilla, for instance, or the cassava bread of eastern South America and the Caribbean.

But they did make excellent use of its medicinal properties along with their "greens" and their gruels. They firmly believed that the seeds were "good against Falls and a Distemper they called Pasnos, whose fits are Convulsions." Bruised and boiled in water, quinoa seeds formed a bitter concoction to be used as a wound-healer for sores and bruises. The Andean herbalists also made poultices from the grain, and they claimed that an infusion of the seeds would cure tuberculosis, no less.

The descendants of the Incas have little left of former greatness except tribal memory. The superb palaces and fortresses are in ruins; the Inca terraces, and the remarkable system of roads that linked the empire have all but disappeared; the ancient crafts are largely forgotten. But the cultivation of quinoa goes on much as it did when Pizarro first set foot in Peru. It is a simple process. In the autumn the (Continued on page 50)



Llamas in highland Peru. Note the terraced hillsides. On some of the terraces the quinoa plant is grown.

PHOTOGRAPH FROM PANAGRA

Botanizing from A Lower Berth

By MAY THEILGAARD WATTS

Illustrated by the Author

"This story is going to be read backward," I told myself, as the City of Denver made its imperceptible start. "Backward for a textbook account, at any rate, or a history book, where stories are usually told in chronological order. But it is good form for a mystery story, where clues start right off pointing to the villain who isn't going to be revealed until the last page."

In addition to being read backward, the story was going to be read, of necessity, chiefly from silhouettes, because the City of Denver leaves Chicago at five o'clock, which means twilight on New Year's Day.



The first visible bit of botany was a Tree of Heaven, growing, true to form, in a place that looked like Hell. It spread bony fingers before a street light at the end of a factory alley, where windows were dark for the holiday.

In a minute or two we were passing lower roof lines, all flat against the gray sky. In another minute the roofs were low enough for irregular scallops of tree tops to show above them—cottonwoods, evidently.



Then the Christmas tree lights began to show. Three-deep they were, under blocks of flat roofs, fringed with scallops of elm tops. But soon they were two-deep only, and the flat tops were lowered enough so that the elm tops showed fan-like.



By the time we were rolling past roofs that sloped over single Christmas trees, the elms showed feather-duster shapes. Then came a stretch of huddled, one-chimney-and-a-television-aerial houses, with haphazard and tired roof lines, where trees reared unkempt heads—evidently cottonwoods and box elders.



And then we rumbled over a bridge, and the long-haired gestures of willows and silver maples outlined a frozen river. But suddenly those lowland brooms of whip-like, swift-growing twigs gave way to a quite different twig formation.



We were in a cut between hills, and the twigs were higher above our heads, and made a tighter, tangled, twisted mass against the sky. It was

plain that these were the gestures of the slow-growing hardwoods: the oaks, hickories, and sugar maples.

The sudden change in twigs came at the point where we left the bottom of the "Lake Chicago" of glacial times—the flat land where the city of Chicago sits, and the men who do her hog-butcherer live.

Now, when we passed openings in the upland woods, it was plain that we were up on the moraines that encircle the city, out in the higher suburbs where live the men who package and sell the butchered hogs, and have white collars and brief cases, and twin beds and coffee tables. Here were wider, two-chimney houses, that drew apart from one another. Outdoor Christmas trees were dazzling here, but the indoor trees were dimmed. This, no doubt, because of Venetian blinds.



Then the house-tops became abruptly lower, much lower, and farther apart, and indoor Christmas trees shone bigger and brighter. We had reached the ranch-house suburbs, where live the men who advertise the packaged hogs, and have tweed suits, and cocker spaniels, and Colorado blue spruce trees. We were seeing those bright trees through their picture windows.



Between the suburban areas, and beyond them, the oak groves went flashing past. They covered all the moraine where man had not removed them. And they

had something definite to contribute to the story we were reading from end to beginning; from effect to cause; from Chicago to Denver.

Their high growth spoke of deep roots. And the deep roots spoke of rainfall of thirty-three to thirty-four inches a year.

A light flashing beside a ringing bell tinted the snow pink, piled car-high on both sides of the highway, proof of this abundant precipitation. Then a line of willows, evidently along a stream, added another comment, as



important as any. All their branches leaned toward the east, and spoke of the prevailing west wind.

As the oak groves were more and more scattered, the shape of silos stood often against the sky. They told of the corn fields we were passing but could not see.

Then there was a different set of lights to watch. Christmas trees were no longer in evidence, except in the cluster of a town, but, beside a silo, there was an occasional long row of square, lighted windows. They told of a farmer who was milking, and, they told of pastureland that we were passing but could not see.

It was interesting to notice that, when barn lights showed it was milking time, the only light in the farmhouse was usually low, at the back of the house. The farmer's wife was in the kitchen, getting supper, probably.



It was time for supper in the diner, too.

But the diner lights were too bright to permit seeing silhouettes outdoors. At one station a bright light shone full on a large "Ful-o-Pep" chicken feed sign, and gave some clue to what we were passing. Otherwise the windows reflected only lights and people, chiefly boys and girls on their way back from Christmas vacation to the University of Colorado at Boulder. They talked of how sleepy they had been at home because of the heavy air, and of how anxious they were to get back to the skiing.

Back in the sleeper I had the berth made up early, so that I could have complete freedom from reflected lights; for watching the landscape unroll.

The darkness helped a lot. The knobby tops of occasional orchards were visible, and even corn shocks once in a while.

The farm lights had shifted since I left for the diner. The barns were all dark now. And there was a light at the front end of some farmhouses where the light in the kitchen still burned. The farmer was, probably, listening to the radio while his wife did the dishes.



Trees were farther and farther apart, and seemed to

be chiefly gathered into the hollows of river valleys. An occasional row of willows still waved airy finger tips toward the east.

We had long since left the oak-hickory forests, and the "oak-openings," and entered the prairie, where grasses dominate the cover that Nature inevitably establishes. The grasses were invisible from the train because they did not stand against the sky as the trees in the oak-hickory climax had done. But, although they were low in comparison with trees, I knew that the native ones, which had greeted the pioneers in covered wagons, were tall in comparison with most grasses. We were crossing the area of the "Tall Grass Climax." And I knew, too, that they were often not so tall as their roots were deep.

These tall, deep-rooted grasses told of abundant rainfall—thirty to thirty-two inches. But the way that

the woods nestled into the hollows suggested that the wind was taking away a considerable part of this rainfall. Not enough to matter to crops, evidently,



because there was usually a serrated silhouette of a windbreak beside a farm house, but no windbreaks in the open country to protect the crops.

Another serrated silhouette closer to the tracks, were the tops of the round, metal corn cribs in long rows. Practically every farm seemed to have a conspicuous wind-mill. And every town had a grain elevator.



The gradual coming in of the grain elevators told of rainfall that had dropped to twenty-eight inches here, and showed that farmers were having to take advantage of the fact that wheat crops can use the winter. The decision between corn and wheat is difficult on



these deep loess beds that make corn production so tempting, even while drier summers make it so uncertain.

I wished for moonlight so that I could see the white-faced cattle that must be feeding out there on that flat land. But there was no moonlight, and all that I saw by straining and peering were black hulks that must have been either the ghosts of buffalo herds—which would have every right to haunt these ranges—or imagination, or sleepiness.

By the time that sleepiness began to get the upper hand, there was practically nothing at all to be seen. No trees. Only telephone poles, and an occasional wind-mill standing alone,



far from any farmhouse. This must be pumping water for cattle, and that must mean land too dry for wheat, too sandy for any other crops except forage, and stream beds that are dry most of the year.

There was one new silhouette. It was a broad windbreak, built of several rows of trees and shrubs. These broad windbreaks were not sheltering



farmsteads. They were sheltering fields.

I thought how the west wind had seemed to gain importance steadily ever since we left Chicago. First, there had been just willows bent toward the east. Then there had been the willows bent east *and* windbreaks at farmsteads. Then there had been the willows bent east, and thicker windbreaks, and many windmills, and grain elevators at every town. Then there had been no willows to be seen, no trees at all, windmills standing alone in fields, thick shelter belts around fields, and few grain elevators.

When I woke up it was still dark. But I saw light in a tiny house under a cottonwood and a tall windmill.

Then there was another light in another tiny house under another cottonwood and another tall windmill.



The oatmeal was being warmed up again.

Then there was a new silhouette.

It was a man. There was a yard light on in a ranch, and he stood in front of it, either facing the train or turning his back to it. I could not see which. But I could see that his silhouette was different from the silhouettes that I had seen in suburbs and towns west of

Chicago. His hat was wider, and his waist and hips and legs were much narrower.



And then I could see the cattle on the gray sand hills. They had a different silhouette, too, from the dairy cattle around Chicago.



There was a new outline to the stores in the tiny towns that lay along the railroad, far apart. It was due to the false fronts on one-story buildings. I saw hitching posts in front of one of them. It was no longer dark.



How straight the lines of the landscape had become! In one place I could see two lines of highway and two lines of telephone poles, and four lines of railroad tracks, all converging to meet at the horizon—just like an illustration in an art instruction book, in a lesson on perspective.

Soon I noticed some new straight lines added to these others. The new ones were the lines of the irrigation ditches. I saw clumps of sagebrush. Their gray-green color is the characteristic color of plants with a thick hairy covering that helps them to hold on to their water.

As the train headed southwest, after North Platte, the grass was short, in clumps and patches, and the houses were farther and farther apart. Each house had its tree, and the tree was a cottonwood.

We were crossing the area with an annual rainfall of less than twenty inches. We crossed a river bed with no river in it; then another, just like it.

Everything spoke of a need for water.

Suddenly, to the west, we could see the force that had shaped the changingsilhouettes; the villain that had picked the west wind's pockets. There were the Rocky Mountains, and on their peaks lay abundant snow.

And then we were in Denver.

In the railroad station in Denver, the train passengers soon mingled with the waiting crowds. But the people from Chicago were still easy to identify. They were the ones who wore galoshes.



Tracks in the Snow

By EVELYN GRAHAM WILDMAN

It's snowing now, large flakes that blur
The sky. They settle thick on pine and fir
In such a gentle, nestling way
That though the branches dip and sway
No thrust can toss aside in wind that sings
This gentle, burden-thing that clings.

Brown fields lie helpless 'neath its fall.
And on white driftings creatures all
Must weave a guiding pattern there
That shows the way to hole and lair.

No beast can walk on living bent.
It does betray for ravishment
The trail each padding foot must place.
And gunning man can easy trace
Each going out, each coming back
So plain the treacherous snow makes every track.

The earth more kind, oft hides the print of fugitive
Who flees with pounding heart to live.
He too loves life. The life God gave
But trusted Man in vain to save.

A 41-Year-Old Goose

By IDA M. MELLEN

THE encyclopedias tell us that geese are long-lived birds and have been known to live for 40 years. Seldom are we treated to a picture of one, however, or to any detailed information.

Jemima, a goose that was hatched on the farm of Mr. William Moffat of Old Linthill, Ayton, Scotland, lived there for 41 years.

Mr. Moffat's house, which is 400 years old, was the ancestral home of the Miln-Home's, an old Border family. It is supposed to be haunted, but the ghost of Lady Billie, who was murdered there in about 1722, is never seen. Her murderer was the last man to be publicly hanged in Scotland, and the spot where he paid for his crime still bears a brass marker.

Perhaps you will say the antiquity of a house can have no bearing on the antiquity of its goose, but certain it is that Jemima established a longevity record on those ancient premises.

It was in the spring of 1911 when Mr. Moffat placed four goose eggs under a hen. From them two ganders and a goose were hatched. The goose was kept as a pet and spent her long life among the hens. She appeared to recognize her unique position, and in constituting herself the boss of the henyard made it clear that she wanted human visitors also to understand her sovereignty. When Mr. Moffat's sister appeared with a pail of feed Jemima would call for the hens to come—and they came, running. Her voice could be heard far and near at feeding time, and when strangers were present she screamed still louder.

Jemima was a white goose of uncertain breed, but believed to be Japanese or Chinese. She developed a habit of sitting under the hens and her feathers were not always as white as they were entitled to be. She has established a very interesting biological fact, that is, that a goose will lay eggs until she is nearly 30 years old, Jemima having laid them regularly until about 1940.

As she aged she strenuously objected to the afflic-



tions of advancing years and reminded the Moffats of a querulous old man, limping about with rheumatism and grumbling to herself.

The psychology of cockerels is also revealed in the life of this rare goose. Mrs. Moffat relates that it was never possible to keep one because the cockerel invariably became jealous and attacked the goose!

The photograph shows Jemima at the age of 41, sitting in Mrs. Moffat's lap. Mrs. Moffat is an English lady who married Mr. Moffat in 1940, and therefore knew Jemima well for a dozen years before the old bird passed away in September, 1952. We are indebted to her for the picture and the facts which she has so kindly provided concerning her husband's remarkable pet goose, Jemima.

★

This Field

By BURNHAM EATON

When I am crowded in with thoughts that go
Compressed, that push and find nowhere to turn
Nor room enough, oh, may this field I learn
By heart, come back to free me—where a fern
Can rise through matted moss with room to grow—
Where trees touch off the sky with brash concern
In open declaration from a crow,
And all the flock rise sinuous and slow.

Unicorn of the Sea

By RICHARD HARRINGTON

Photographs by the Author

WHEN a medieval man found a single, white, spiralled horn on the beach one day, it convinced him of the existence of the unicorn. Everyone said that such milk-white steeds roamed the hills of India. This proved they really existed.

It did not trouble finders of such tusks that India was far, far away. Nor did they wonder a great deal how these tusks found their way to the shores of northern Europe. Of course, since these horns were always found on the coasts, they must belong to some kind of sea-horse, undoubtedly a unicorn of the sea. In fact, no one doubted the reality of unicorns until after the Elizabethan era.

By the time naturalists got to the bottom of the mystery, the unicorn had taken a firm place in heraldry. There it remains, on the coats of arms of Scotland, England and Canada. And it belongs there as much as anywhere, for the real unicorn of the sea is not found south of Baffin Island.

Many people treasured the tusks. One ruler of a small duchy had his throne built of them. And they were often cut up into drinking horns, for unicorn horn was regarded to be a sure preventative of poisoning. Even the unicorn design engraved on a drinking-cup was a help. And in China, even to this day, the horn is still being ground up and used as a potion in drugs.

It was in 1655 that the scientist Wormius debunked the unicorn story. The spiral tusk did not spring from the forehead of a noble horse, sea or land, he declared, it was part of a whale. "Those long horns preserved in many places are but the teeth of Narh whales."

But what a tooth it is! It reaches up to nine feet in length. Fortunately for its owner, most of the tusk is hollow, but even so it may weigh up to twenty pounds. It is the single maxillary tooth usually on the left side of the upper jaw of the male narwhal, a large porpoise of the Arctic Ocean. *Monodon monoceros*, as this animal is known to science, has a second rudimentary tooth which rarely sprouts to form a pair of tusks.

Poets, of course, found much inspiration in the narwhal, even when they knew better. "Where the monstrous narwhal swalloweth his foam fountains in the sea..." sang Tennyson, describing the land of the Lotos Eaters. "Mighty monoceros with immeasured



An Eskimo from the south shore of Baffin Land holds two narwhal tusks.

tayles" wrote another poet, inspired by this animal.

Admittedly, the early viewers were not accurate as to measurement, and believed that the narwhal was sixty feet long. As with most whales, the length has been grossly exaggerated, and the narwhal is seldom more than sixteen feet long.

Instead of being a milk-white unicorn, only the oldest narwhals reach a silvery stage. Usually there is quite a variation in coloring and marking, the top is darker than the underparts, and the young darker in color.

Narwhals are still plentiful in the seas around Greenland and on the east coast of Baffin Land, where most of them are now taken. They somewhat resemble the beluga or white whale, and are a little larger. Greenland Eskimos formerly supposed that the white whale was the female of the species, which has no tusk.

Like the beluga, the narwhal is gregarious. He likes chumming around in schools of fifteen to twenty, or



An Eskimo carving of a narwhal in sandstone.

more. And when the irresponsible males get together, they act quite playful, elevating and crossing their tusks. William Scoresby, the whaler with a literary flair, observed shoals of these animals, consisting entirely of males, that "played with their horns, crossing them with each other as in fencing." It is all done in play, according to observers, although some insist that the males fight over the females. Some suggest the tusk is used to break ice or impale prey.

Because the underside of the tusk is usually worn flat from contact with the ocean floor, it was once thought that the narwhal went cruising along the bottom after his food, which includes cuttlefish and clams. These he was said to spear and kill with the point of his tusk, which he then used as a skewer, working the food down closer to his mouth and sucking it in when hungry. A rather ingenious theory, but scientists shake their heads.

It does not seem fair, at that, since the female is not similarly equipped. The same thing is wrong with the idea that the narwhal butted holes in the ice with his ramrod tooth, when he came up to breathe. The female must breathe, too. The narwhal does make holes, but with his cushioned forehead. Usually he takes advantage of open water by using holes bumped through by walrus. The narwhal has never been known to charge and pierce the bottom of a boat as

swordfish have done, although he is adequately equipped.

There used to be a lot more hunting pressure on the narwhal than there is today. Old-time whalers pursued them, along with larger mammals of the sea, because of the high quality of their oil. At one time a shareholder in a whaling company thought it would be practical to run a railway with this fuel.

M. P. Porsild, reporting in 1918, said that when narwhals and white whales are restricted into bays by freezing and cannot escape, they crowd around open holes. The male rests, sometimes asleep, with its tusk on the ice through one of these holes. Trapped by that habit, they were slaughtered in great numbers.

They are still harpooned by Eskimos, who value the fat blubber for their lamps and as dogfeed, and as meat for their own consumption. The Eskimos are practical people, and quick to make use of whatever Nature provides. But even they have not found much to do with the narwhal's horn. It is not "ivory," but bone of good quality, although lacking enamel. The grit-filled spiralling is difficult to clean and polish.

Of course, the tusk can be sawn apart and polished up into napkin rings. Or a tusk might be wired and used for a lampstand. A small tusk might be used as a walking cane if canes were not out of style. Actually, it is almost as difficult to know what to do with a narwhal tusk as to discover how it serves the narwhal.

★

Old Stageroad

By HARRY ELMORE HURD

We chose the stageroad, hemmed by brush and grass
So tightly two invaders could not pass
If they were wider than a horse and plow.
Few would travel such a cartroad now
That numbered highways circumvent
The secret areas of wonderment,
But we forsook the straighter, wider, road
As do the woodchuck, fox and lowly toad.
There were no farms to claim the wooded land,
And yesterday lay deep in silent sand,
But where the road descended to the vale

A masked raccoon, dragging its black-ringed tail,
Ran along the wall, then turned, surprise
And fear gleaming from its questioning eyes
And, not a long stone-throw ahead, a boy,
Out of nowhere, whistling to voice his joy,
Swung jauntily downward from a nearby knoll
Into the road, bearing an alder pole
And can of worms. How could the small boy know
That I, a freckled fisherlad, long years ago,
Lifted beauty with a bent-pin hook
From secret shadows in the meadow brook?

Some Large Marine Fishes

By E. LAURENCE PALMER

Illustrated by Ellen Edmonson

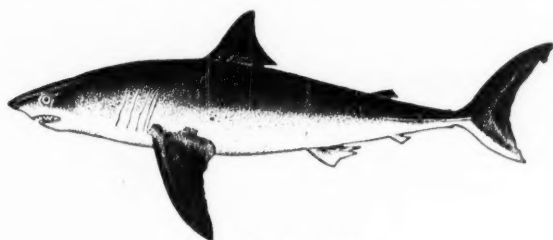
This is the seventy-fourth in NATURE MAGAZINE'S series of educational inserts.

IN THE spring of 1952 a fishing tackle company sent me a pocket piece that was a token for good luck when fishing. I showed it to a friend, who promptly pocketed it insisting that he needed it more than I did. Not long afterward I went on the most momentous fishing trip of my life—without the luck token. I had spent



THRESHER SHARK

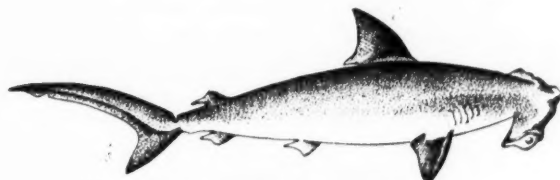
several days at the professional meetings of the Outdoor Writers Association of America in Miami, Florida. These sessions came to a climax on Friday, the thirteenth, when we pulled out of the harbor at Miami on a chartered cruiser in search of something big in the fishing line. Ours was the good ship *Riptide*—captain, Ollie Knittle—and I doubt that any combination of ship and captain could have provided a more exciting afternoon.



WHITE SHARK

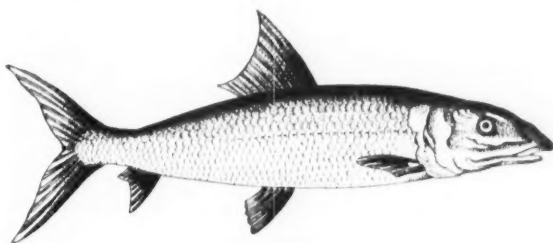
I have no faith in lucky tokens, and no fear of Friday the thirteenth, and I surely can blame neither Captain Knittle nor his yacht for what happened. However, that afternoon's experience is the chief reason why I elected to write this seventy-fourth special insert on large marine fishes.

Four of us Outdoor Writers had lines out as we passed the last buoy to our port side at the entrance of Miami



HAMMERHEAD SHARK

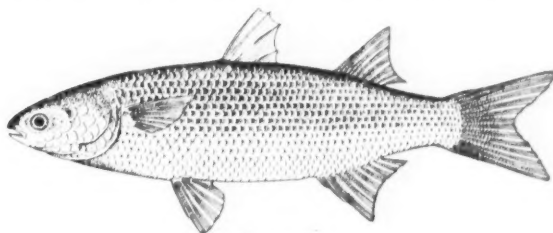
Beach harbor. Then things began to happen. A former student of mine, Mary Sherwood, "manned" the pole to the extreme port side, and I had the pole on the opposite side. Between us was a gentleman named Kelly from Canada, whose one ambition was to show his son a big fish when he got home. The fourth was a sporting goods dealer from the mid-west. Just as Mrs. Sherwood's bait passed the last buoy a huge, curved, dorsal fin cut the water in its vicinity. The hook was struck home and from then on, for more than six hours, things happened. Mrs. Sherwood quickly handed her pole to Mr. Kelly, saying that she could not handle the catch. At the time I wished that she had handed it to



BONEFISH

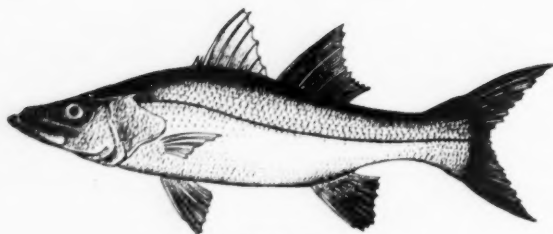
me, but eventually was glad that she had not. The huge blue marlin at the end of her line almost immediately leaped into the air and then set off. Captain Knittle settled down to a job that took him from Miami Beach more than twenty miles to Fort Lauderdale before darkness came.

After a long fight Mr. Kelly found he could not keep it up any longer and I took over, even though in doing

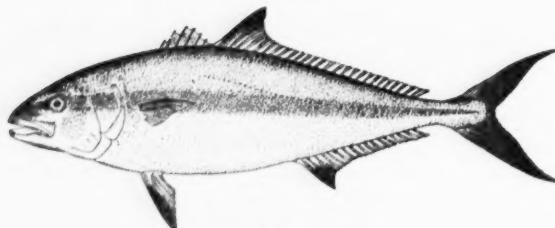


MULLET

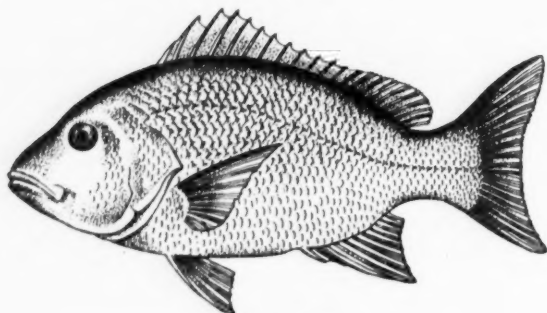
so the catch could not be recorded and credited to anyone. I kept at the job until I could do no more, and a boatman took over, with similar results. Eventually we got the huge fish up beside the boat. While I held a flash light on him the boatmen carefully drew the wire leader closer to the gaff. At the last instant the fish dove for the boat's propeller and the wire was snapped



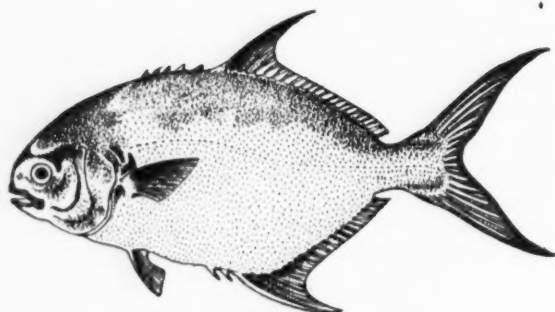
SNOOK



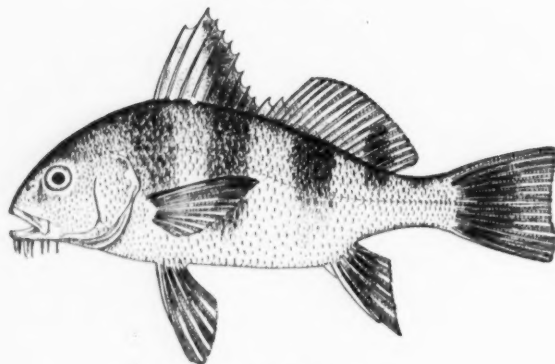
YELLOWTAIL



RED SNAPPER



POMPANO



BLACK DRUM

off short. The day was done, and a marlin, estimated by the experts on board to have weighed about two hundred pounds, went on his own with a hook about mid-marlin instead of in its jaws. I would have given a lot to see that fish mounted in Fernow Hall at Cornell University to rival the prize fishes of others on the university's faculty. Even so, I confess I would have been a little regretful to have seen the fish lose the fight after contending against the combined efforts of a large power boat, three professional fishermen, and four amateurs. The marlin deserved freedom.

I probably should apologize for recounting my experience with a big game fish of the sea. I have caught other good sized fishes of the various oceans I have visited, but I will never forget that bundle of "fight" at Miami.

If you will read the life history charts that accompany this insert you will notice how many of the species considered serve, either primarily or secondarily, as sports fishes. I could easily write the rest of this article about the recreational value of catching big game fishes. If I had the time I would tell you about a week end off the California coast with the tuna fleet, about catching mackerel off the coast of Mexico, and so on. But if I started in on that I would, in justice, have to tell about fishing for trout this year, as a youngster and in the years between. Before I got through with piscatorial reminiscence I fear you would be bored. Anyway, Dick Westwood, the editor of *Nature Magazine*, would use his blue pencil on my ramblings.

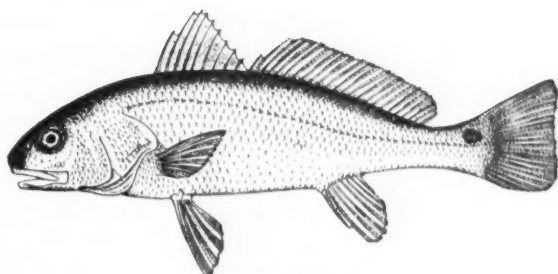
R. W. Eschmeyer, Executive Vice-president of the Sport Fishing Institute and an inveterate writer of excellent material, expresses the pooled judgment of most writers when he tells us that, to probably 25,000,000 of the 160,000,000 Americans, fishing represents the leading form of outdoor recreation. I can no more argue with him about those figures than he can argue with me about the size of the blue marlin we met near Miami. But we are agreed that to a substantial segment of our population, as Jack Van Coevering of the *Detroit Free Press* so aptly summed it up, "Fishin' for Fun" makes life worth living. Most of us fish for small, fresh-water panfish, largely for the fun of it. No doubt there are some like a certain southern gentleman, who insisted that he fished to prove to his wife that he did not have time to pare potatoes. There are many, however, who plan their lives in accordance with tides, open fishing seasons, and other factors, like migrations, that are likely to bring a man and his fish together with satisfying results to the human, at least. I have yet to decide whether the fact that they closed the trout season in New Zealand the day before I arrived and opened it the day after I left was good planning on the part of the New Zealanders, or poor planning on my part. At any rate my failure to synchronize dates reduced a bit the entire pleasure I got from that sojourn "down under."

As our populations grow larger, and as the speed of living increases, it is important that we preserve wholesome ways of getting recreation. To me fishing ranks about tops in this category. Whether I catch anything

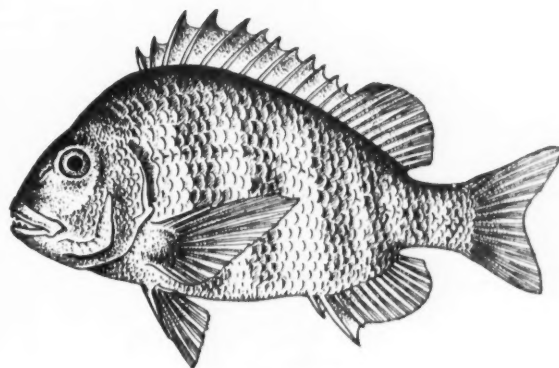
or not is less important than that I have the chance to try, and at least the hope that I may have luck. If we allow pollution to continue, if we increase the effectiveness of harvesting fish wholesale by mechanical means, if we continue erecting dams that prevent the reproduction of fish that must breed in fresh water, even though they develop in the seas, if we harvest indiscriminately the plants and small fishes that form the base of the food pyramid that supports large ones, then there is no hope for big sea fishes and for those who like to try to catch them. I might suggest that there even has been a decline in the wholesomeness of those who chronicle fishing, when I compare the English and philosophy of Henry Van Dyke with the jargon of Ernest Hemingway. Somehow I have faith that fishing ordinarily brings out the good in a person, providing, of course, it is there to be brought out. Three hundred years ago Izaak Walton wrote a little book on his philosophy of fishing. I rather think that *The Compleat Angler* and Henry Van Dyke's *Fisherman's Luck* will be read and appreciated long after we have forgotten a recently reported combat between an old man and a huge fish of the sea whose spine could be measured accurately even after its carcass had been torn to pieces by the sharks.

Zane Grey told us much about the joy of catching big fishes in various parts of the world. Many of us envied him his experiences. Most of us, however, have had some experience with fishes that came from the sea. We buy salmon, tuna and bonito in tin cans at the grocery. The old country store used to have dried cod, halibut, herring, and mackerel in a still recognizable form. There are few of us who have not eaten shrimps, clams or oysters that help to make up the food of many of the larger sea fishes, so really we do have some contact with the subject of this insert. With refrigeration what it now is, the number and variety of sea fishes available in a reasonably fresh form is greater than it was a generation ago. It is obvious that society recognizes a place for fishes in the lives of all of us. It behooves us to see that the supply is continued beyond our time. This is most likely to eventuate if we understand what it is all about. The Government Printing Office in Washington issues a 50-cent bulletin on the *Fisheries Resources of the United States*, which should be in every home and school in the country. We have no intention here of paraphrasing it, even in part, because we do not have the space to do so adequately. Get it for yourself for your library.

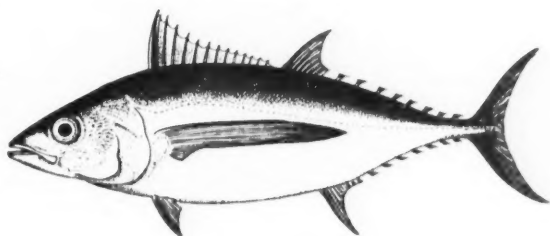
As is the case in any natural resource, the large fishes of the sea serve us variously. Surely we get fun from an afternoon when we are joined by a line with a huge blue marlin. But every Friday at my restaurant, whether I like it or not, there is fish on the menu, in the soup and in the air. Eventually some of it is in my stomach, and as often as not it is from a marine species. I go to a high-class social function, and am offered tunafish salad. Or I may find myself off in the corner surreptitiously getting rid of some fish-eggs that came from a sturgeon, which came from the sea, and got mixed into the little sandwiches that I unwittingly (Continued on page 32)



CHANNEL BASS



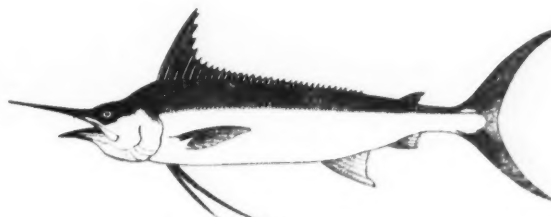
SHEEPSHEAD



ALBACORE



SAILFISH



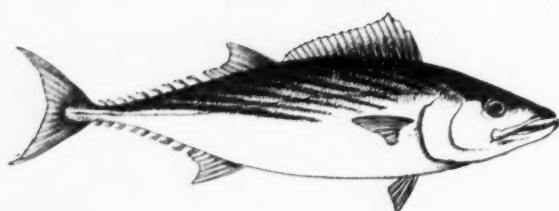
BLUE MARLIN

NAME SCIENTIFIC NAME	THRESHER SHARK <i>Alopias vulpinus</i>	WHITE SHARK, MAN-EATER <i>Charcharodon carcharias</i>	HAMMERHEAD SHARK <i>Sphyrna zygaena</i>	BONEFISH <i>Albula vulpes</i>
DESCRIPTION	Length to 25 feet, one-half of which may be upper lobe of tail. Weight to nearly 1000 pounds; a 13-foot shark may weigh 400 pounds. 5 gill slits, with last over pectoral fin. Eye, small. Scales, minute. Spiracles, missing. Teeth, small, triangular, smooth-edged. Snout, blunt. Mouth, below. White beneath; dark above.	Length to over 40 feet? A 21-foot animal weighed 7302 pounds, reputedly. Dull gray above, dull white beneath. Teeth, large, triangular, saw-edged, 26 on upper and 24 on lower jaws. Head conical but wider than deep. Gill openings wide, 5. Membrane or fold closes over eye. No spines in dorsals. Pectoral, dark spotted.	Length to 18 feet. Weight to 1500 pounds. A 12½-foot animal weighs to 900 pounds. Head to 3 feet wide, with eyes at extremities and nostrils in slit along front of snout. Membrane of fold may cover cow-like eyes. No spiracles. 1st dorsal high. Tail to 1/3 total length, upper lobe 3 times length of lower.	Length to 3 feet. Weight to 20 pounds. Usual weight about 2 pounds. Dark blue or greenish above and silvery on sides, with narrow, faint horizontal stripes and 8-12 dusky vertical bars. Fin bases yellowish. 65-75 scales in lateral line. Scales small, silvery. Mouth under pig-like snout, small.
RANGE AND RELATIONSHIP	One species bearing many names such as Fox, Swivel-tailed, Whingle-tailed, Whip-tailed Shark. Ranges widely northern Argentine to Nova Scotia; New Zealand to Japan. Most abundant in summer off New England, but never there in winter. Essentially an off-shore form. Order Lamniformes. Family Lamnidae.	Order Lamniformes. Family Carcharhinidae. Ranges off shore, rarely abundant, most common off Australia. Found Nova Scotia to Brazil and Monterey, California, to Australia in tropical and subtropical waters. Found also from Spain to Cape of Good Hope in eastern Atlantic. Usually near surface, but a record of 700 fathoms is claimed.	Order Lamniformes. Family Sphyrnidae. Abundant in warm seas near or off shore, north to Maine and Japan. Known from Miocene times as fossils. 5 species, of which 3 are found off California. Bonnet-head, <i>S. tiburo</i> , spade shaped head with even form; Scalloped Hammerhead, with head notched in front.	Order Clupeiformes. Family Albulidae. Known as fossil family since Paleocene but <i>Albula</i> is recent. Closely related to ten-pounder <i>Elops</i> . Air bladder not connected to ear. Found in worldwide distribution in tropical and semi-tropical seas from Cape Cod and central California southward.
HABITS	Little known of life history, but female bears few young and these are large. A 14-foot female was found bearing an embryo 5 feet, 1 inch long. Maturity apparently reached in female at a length of about 14 feet. Young have been taken off Florida and New England.	Almost nothing known of its breeding habits.	Authorities differ as to whether this shark lays eggs or gives birth to living young, and wise writers merely state fact that up to 37 embryos have been taken from a single female. Young to 2 feet long, may be common in region of New York in summer. Young probably shift for themselves at once.	Probably eggs laid in deeper water. Young found in schools in harbors and shallows at night as transparent ribbons with dark eye spots, feeding at surface. At 3½ inches shrink to 2-inch length and assume usual adult fish form. Few spawning areas known.
FOOD	Food: fish such as herring, menhaden, mackerel taken by forcing school into compact circle, possibly by exciting by tail movement. Individuals may work together but reputed cooperation with swordfish is probably not authentic. Swift, nervous swimmers becoming exhausted if confined. Essentially surface feeder.	Feeds partly as a scavenger, but also on fishes, turtles, squids, other sharks, sea lions. One is recorded as having swallowed a horse whole, and a 30-foot white shark swallowed a whole young sea lion. Even a 7-foot shark was found to have eaten young sea lions whole. Tremendously hardy.	Food includes fishes, squids, crabs, sting-rays, barnacles. Teeth on upper jaw similar to but larger than those on lower, and with saw-toothed edges. Fast swimmers with extraordinary ability to change direction, the head helping in vertical change of direction. Fins dark tipped, especially the pectorals.	One of the fastest fishes known. Suspicious. Feed on mollusks and other small animals in mud on bottoms of shallows, often showing back and fins while feeding. Often feed in schools. Taken on hooks baited with crabs or mollusks dropped quietly in front of feeding school.
ECONOMIC IMPORTANCE	Not dangerous to man. Nuisance to fishermen, whose nets may be destroyed. Takes a baited hook and makes good game fight. A 922-pound fish is probably the rod and reel record. Flesh is popular as food in Japan and has been compared favorably with salmon but not emphatically so.	Probably worst of man-eaters, and worst at Australia, but has caused fatalities off New Jersey coast. Swimmers must be protected by nets where this shark is common. Known to attack boats when hooked or harpooned, but does not leap from water when hooked. Puts up prolonged and vigorous fight when hooked.	Known to attack man in Australia, and an 1805 record of one with human flesh inside in America, but probably its danger is overestimated. Skin thin, makes fine leather. Liver valuable. Flesh fine grained and popular as food in Japan. Because of activity and hardness is one of best shark sport fishes.	Because of speed and fighting ability considered one of finest of sport fishes, even though its flesh is usually considered of little food value. May be taken on fly. Initial run may be for 125 yards. Plugs, Brown Hackle flies, sand fleas, shrimps, and small hermit crabs used as lures.

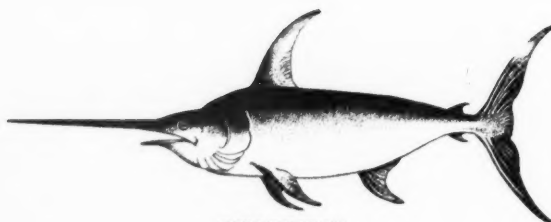
STRIPED MULLET <i>Mugil cephalis</i>	SNOOK, ROBALO <i>Centropomus undecimalis</i>	PACIFIC YELLOWTAIL <i>Seriola dorsalis</i>	RED SNAPPER <i>Lutjanus blackfordi</i>	COMMON WEAKFISH, SEA TROUT, SQUETEAGUE <i>Cynoscion regalis</i>
Length to 2 feet in the southern part of range, to 1 foot in the northern. Slender, with broad blunt snout. Teeth, minute. Scales, large, particularly on head. No scales on soft dorsals. Silvery, with dark heavy stripes on scale rows. 37-41 scales in lateral line. Dorsal fins well separated with four spines in 1st.	Length to 4 feet, but more likely about 1 foot. Weight to 51 pounds. Pike-like in appearance with long concave snout, longer lower jaw and relatively large eyes. Silvery in appearance, but dark greenish-brown above and with prominent, narrow, black lateral line. Dorsal fins dusky; ventrals yellowish. Fully and roughly scaled.	Length to 5 feet. Weight to 90 pounds. Shows conspicuous yellow stripes along the sides. Upper parts and back green or pale blue with silvery on the sides and beneath. Fins yellowish. 15-17 gill rakers on first gill below angle. A blunt keel is found on each side of the base of the tail area.	Length to 3 feet. Weight to 35 pounds. Sides, fins, eyes and whole body rosy red with black edges on tail and dorsal fins. Intensity of color may vary. Iris red. Rays in soft anal fin, 9. Large-headed, stocky fish with medium sized scales and a high arching lateral line.	Length to more than 2½ feet. Weight to 30 pounds. Silvery brownish above, with bright back and sides with irregular dark spots to streaks. Fins pinkish, yellowish, or greenish. Lower jaw the longer. Upper jaw with 2 large canine teeth not duplicated on lower. Mouth large and soft, giving the name "weak" to the fish.
Order Mugiliformes. Family Mugilidae. Found from Maine to Brazil and from California to Chile, also in Hawaiian Islands and Salton Sea. Related white mullet reaches 3 feet, and Brazilian mullet 18 inches. Former has soft dorsal and anal fins scaled. Latter has from 31-32 scales in lateral line.	Order Perciformes. Family Centropomidae. In tropical salt water from Florida to Brazil with center of United States abundance in Florida. Some thousands of pounds are taken annually along Texas coast, but the fish is more abundant in Mexico and Central America. This is not the snook of South African coasts.	Order Perciformes. Family Carangidae. A Pacific Coast species ranging off southern California and western Mexico shores; also found in Australia and South America. It is usually found off rocky shores, but also haunts kelp beds that support the smaller fishes on which it feeds. It is called California Yellowtail.	Order Perciformes. Family Lutjanidae. Long Island to Brazil, sometimes north to Massachusetts, but most abundant in the Gulf of Mexico-West Indies area. There are more than 200 species of snappers in the family included in some 20 genera. At least a half dozen in this genus are commercially valuable.	Order Perciformes. Family Otolithidae, or, by some, the Sciaenidae. Included as weakfish are the Gray, with 10 anal rays instead of the 9 in others; the Sand, with pale coloration and no definite spots; the Spotted, with scaleless soft rays and body covered with spots, and the Common, as indicated above. Florida to Massachusetts.
Striped mullet spawn in autumn and early winter. Whitemullet spawn in May and June. There are nearly 100 species of mullets. They are all more or less of the schooling type, usually moving against tides and upwind. They may leap freely into air when pursued or when being netted.	Little known about the life history. The animals are reasonably abundant the year round where they are found, and while they may ascend streams to the limit of brackish water this may or may not be associated with breeding habits. The fish appears in schools and in Florida bite most readily in early summer.	Little is known about the breeding habits, or about its migrations, which might give some clue to these habits. They spawn in spring and summer and may be abundant off San Diego from March to May, and off Los Angeles from April to June. In fall and winter, they are found off Lower California.	Spawning probably takes place in deep waters off-shore as the young are rarely found in shallower waters. During the spawning period, which probably is in late summer or autumn, they rarely bite baited hooks, though this is not known as a fact. The schools of fish move about considerably.	From May to September from South Carolina to Cape Cod the eggs are laid near bottom, at depths of 3 to 5 fathoms. They float to surface and hatch in 1½ days. The young soon resemble the adults, and reach sexual maturity and spawn when from 3 to 4 years of age. Spawn regularly annually thereafter.
Feed largely on plant material taken in with mud and other extraneous substances. May be taken on such baits as bacon, bread, bananas and sometimes on light artificial flies. They may bite readily at night and jump freely when hooked. They are not netted easily except with large seines.	The small teeth are appropriate since snook feed largely on shrimp, crabs and small fishes. They do not pull shellfish like oysters from rocks, nor do they feed on large fishes. They are often found most abundant around pilings and in mangroves, where they can feed on small animals that may abound there.	Food is largely the smaller fishes that have the schooling habit, such as herring, mackerel, sardine, flying fishes, smelts and anchovies. They may also eat squids and shrimps. They dash wildly into the schools of their food organisms. May be taken by trolling or with a baited hook.	Food, crustaceans, shrimps and small fishes. They move out of waters where temperature goes below 50° F. and some believe that they move inshore in autumn. They may be most abundant 10 to 25 miles off shore in waters to 300 feet deep and when in schools may bite furiously.	Food is small fishes like mullet and herring and eels. Also eats shrimps and crabs. The "schooling" small weakfish weigh to 5 pounds and the larger more solitary common weakfish feed in surf and more active water, often taking baits at night. Smaller spotted weakfish commonly found over quiet flats and bars.
One of the most popular of baits when scaled and cut into strips. Flesh is from good to excellent depending, in part, on what it may have been eating. It is one of the more important commercial species to be found within its range and is popular as human food, for sport and for bait.	Some 500,000 pounds are caught annually in the United States, largely by sport fishermen. Plugs and baits are taken with a rush, and a good fight follows. The flesh is excellent, white and flaky, and is eaten fresh or smoked and eaten. The rod and reel limit is one that weighs 50½ pounds.	A commercial fish, being sold fresh, canned or otherwise processed. Sells like a cheaper tuna and an annual California pack might be 60,000 cases, although the take is apparently growing smaller along with the reduced amount of menhaden and anchovies available for its food. One of the most popular of sport fishes.	About 8 million pounds of snappers are taken annually by commercial fishermen, mostly in the Gulf of Mexico area. Many are taken by still fishing with hook baited with small live fishes or cut bait. Food value of the flesh is high and the sport value is considerable.	Annual catch of gray weakfish may reach 25,000,000 pounds. Record rod and reel catch of a weakfish is 17½ pounds. One of the most popular of all saltwater fishes. Larger fish leave shores in fall and return in spring off North Carolina coast. Male makes drumming sound, using air bladder in part.

NAME SCIENTIFIC NAME	BLACK DRUM <i>Pogonias cromis</i>	CHANNEL BASS <i>Sciaenops ocellatus</i>	SHEEPSHEAD <i>Archosargus probatocephalus</i>	POMPANO <i>Trachinotus carolinus</i>
DESCRIPTION	Length to 4 feet. Usual weight 3 to 6 pounds, but some records of 50 and one of 146 pounds given. Hump-backed, with mouth set low at end of short, blunt snout and with numerous barbels from chin to below middle of eye. Adults silvery to brassy, becoming gray when dead. Young with 4-5 dark bars.	Length to more than 5 feet. Weight to about 85 pounds. Gray-silver with coppery or coppery-red cast, and with one or more conspicuous black spots near the base of the tail. Head long and without barbels, but with large outer teeth on the upper jaw. Fish under 15 pounds known as puppy drum.	Length to 30 inches. Weight to 30 pounds. Body conspicuously and coarsely banded with black over dark olive above and pale silver beneath. Name derived from protruding flat teeth such as show in a sheep. Bands darker and more distinct in younger fish. No distinct shoulder spots.	Length to 18 inches. Weight to 8 pounds. Average size, 1 to 2 pounds. Upper parts dark blue with head somewhat darker. Body silvery with golden touch. Dorsal fins blue. Anal fin, light orange. Tail dusky with a yellow border. Lacks cross bars found in related <i>T. glaucus</i> . Adults toothless.
RANGE AND RELATIONSHIP	Order Perciformes. Family Sciaenidae. Black drum has 41-45 scales in lateral line; the Atlantic croaker 64-72. Black drum has long, strong 2nd anal spine and high spines in the dorsal fin. A substantial fish in which a 3-foot fish would weigh about 34 pounds, or a pound to an inch.	Order Perciformes. Family Sciaenidae. Found along the Atlantic Coast from New York to Mexico, and on to Panama. Its best specimens are taken off the coasts of Virginia and North Carolina. They may be found in deep seas, but more commonly feed in inlets and bays; often brackish water near bottom.	Order Perciformes. Family Sparidae. Family, the Porgie Family, does not include the fresh-water sheepshead, which belongs to the drums, Sciaenidae, or the Pacific Sheep-head, <i>Pimelometopon pulchrum</i> , which belongs to the Wrasse Family, Labridae. <i>Archosargus probatocephalus</i> ranges from Massachusetts to Gulf of Mexico, Tampico.	Order Perciformes. Family Trachinidae. Presence of 25 dorsal and 23 anal rays in fins distinguishes common Pompano from the round P. and the great P. which have 19-20 in the dorsal and 17-19 in the anal fins. Ranges from Cape Cod to Brazil and not known on the Pacific coast.
HABITS	Spawns in Gulf of Mexico from February through May, but found along Atlantic coast from Cape Cod to Argentine. Eggs deposited near bay entrances, a 44-inch fish laying to 6,000,000 eggs. Males give drumming sound during breeding period. To 10 inches at 1 year and matures at 15 inches the second.	Spawn chiefly in autumn along Texas coast about the mouths of inlets. Young drift with the tides into bays and lagoons. Here they develop rapidly with abundant food and shelter. By first winter, are 2 to 6 inches long, but in spring may move out into deeper waters. At 1 year, 13½ inches; at 2, 21 inches.	Spawns in Gulf of Mexico in March and April in to 8 feet of water over sandy bottoms. Eggs are round and when laid float to the surface where development continues. Adults not normally common over sandy bottoms except during breeding season. Eggs hatch in 40 hours at 77°F., non-adhesive and .8 mm.	In Gulf of Mexico spawns from April through June, with the females appearing well beyond the surf line and the young in the surf. Spawning is in moving water, probably over hard bottoms. North of New Jersey only young pompanos are found, indicating a juvenile migration north.
FOOD	A bottom feeder, eating shellfish and crustaceans, which are crushed by strong teeth. May feed in schools over oyster beds and have been reputed to do great damage to them. May also eat fishes in some amounts. Taken using cut bait or clams as bait and fished close to the bottom. An indifferent fighter.	Primarily bottom feeders, eating mullets, menhaden and similar small fishes, as well as shrimps, crayfish, sand fleas, squids and marine worms. May be taken by casting plugs or baits into surf, or by trolling or still fishing. They prefer a moving bait. Taken day or night usually at turn of tides.	Food is gleaned from bottom; includes mussels, barnacles, crabs, shrimps, oysters and similar animal life. Because of food, these fishes are found around rocks, docks, wrecks and the like. Most commonly taken at slack, high or low tides from May to September in northern part of the range.	Food is small animals such as crustaceans, hermit crabs, clams, shrimps, sand fleas and so on. Often appear in schools, but are influenced by temperature changes and may vanish from an area suddenly. Young may feed at water's edge being washed out with one wave and back with the next.
ECONOMIC IMPORTANCE	Important commercial fish with to 2,000,000 pounds representing an annual catch. On the debit side is the damage done to valuable oyster beds. The flesh is of mediocre quality and is coarse. The hard scales are used in making some kinds of cheap jewelry. 50%-80% from Texas. Inshore fish, black; offshore, silvery.	Excellent as food fish and superior as game fish, with sports fishermen and commercial fishermen probably harvesting about equal amounts. About 1,500,000 pounds are taken commercially in nets and sold in the fresh fish market. The species is one of the most important fishes of the South.	Of excellent food value and a popular fish with those fishermen patient enough to be still fishermen. Small crabs seem to be the most popular bait. A hooked fish makes an excellent fight, being considered one of the best fighters. Commercial fishermen take limited amounts in purse and haul seines and on lines.	Less than a million pounds taken annually by commercial fishermen. Now recognized as a game species by men who favor them above all others. Food value extraordinarily high. The entire crop harvested by commercial fishermen is used in the fresh-fish market, principally in the North.

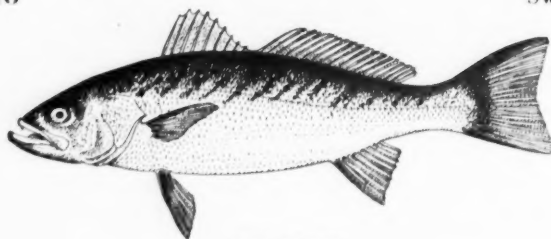
ALBACORE <i>Germo alalunga</i>	SAILFISH <i>Istiophorus americanus</i>	BLUE MARLIN <i>Makaira nigricans</i>	SWORDFISH <i>Xiphias gladius</i>	BONITO <i>Sarda sarda</i>
Length to 5 feet. Weight to 66 pounds. Upper parts dark blue, becoming iridescent bronze to silver on sides and beneath. Fins bright yellow, possibly tinged with blue. Long pectoral fins reach beyond base of anal fin. Scales small. 7-8 finlets behind anal and 2nd dorsal.	Length to 8 feet. Weight to about 105 pounds. Back and upper areas bright dark blue. Sides and underparts bright silver, sometimes with lavender vertical lines. Dorsal high and dark purple with indistinct blotches of darker color. Conspicuous, long, slender upper jaw.	Length more than 13 feet. Weight more than 1200 pounds. Dark blue on back and upper sides, with lower parts silvery with sometimes narrow lavender bands running vertically on the sides. Dorsal fin, dark blue. Other fins, purple black. Dorsal fin, long and continuous and sickle shaped ahead.	Length to more than 15 feet. Weight to more than 1000 pounds. Conspicuous because of long, pointing, bill-like upper jaw. Lacks pelvic fins of the marlin and sailfish and has a shark-like dorsal fin. Brownish-black to bronze above and dirty cream-colored beneath. Body naked and without rudimentary scales of sailfish.	Length to 4 feet. Weight to 12 pounds. Back blue-black. Sides silvery, with narrow dark stripes running diagonally upward and backward over upper areas. Ventral fins whitish. Other fins dusky to dark. Entire body is scaled. Lateral line undulating slightly. Mouth terminal and large. Teeth relatively large.
Order Perciformes. Family Scombridae. Ranges through warm seas, occasionally from Massachusetts south to beyond Florida, and in Mediterranean. Also found from British Columbia and Alaska south to Chile, but most common off California in United States area.	Order Perciformes. Family Histiophoridae. Related to the Marlins, which may reach a weight of 800 or more pounds, but belong in another genus. A related tropical species is reported to reach a weight of 1500 pounds. Sailfish of Atlantic from Florida to Massachusetts. Pacific species Peru to California.	Order Perciformes. Family Histiophoridae. Blue Marlin and White Marlin range the Atlantic from Maine to South America, while the Striped Marlin ranges from California to Mexico, and the Black Marlin from Mexico on south. Good marlin grounds are found about Hawaii.	Order Perciformes. Family Xiphiidae. One species and one genus. Wide distribution in warmer seas of the world; in the Atlantic ranging north to Nova Scotia and in the Pacific north to Oregon. It succeeds at varied temperatures and at varied depths, but there is seasonal abundance at different places.	Order Thunniformes. Family Thunnidae. Included in the family are the tunas, mackerels, skipjacks and similar fishes. Oceanic Bonito is in the genus <i>Katsuwonus</i> . In this, the lateral line curves sharply downward. Common Bonito range from Maine to south of Rio de Janeiro and from Mediterranean to the Cape of Good Hope.
Believed that breeding takes place south of United States and Mexico since mature fishes are not found along the Pacific Coast of North America. This means that the young move northward before reaching maturity, as seems to be the case with some other fishes here considered.	Believed, with reservations, to spawn off Florida from June to August, and off Texas later in the year. Young are chunky with only slightly elongate jaws of equal length, with low dorsal fins and the head with barbed spines. By the time young reach length of 20 inches they resemble the adults in general.	Neither eggs nor larvae have been collected in American waters, and the smallest identified specimen was a 5-pound fish taken in the Gulf Stream off Miami Beach. There is suspicion that Blue Marlins breed off the coast of Cuba, but no concrete acceptable evidence to prove it.	In Mediterranean fish may swim towards shore in twos or threes from June to September, and some may come near shore off Cuba for breeding. Other breeding areas known. Eggs float and hatch in 2½ days. Young have rounded tails, equal-lengthed and toothed jaws and scales or plates over body. Resemble adults at ½ pound.	Spawning season in New York area is June and by September young fishes to 6 inches long are taken in that area. Little seems to be known about the general life history. The fishes occur in schools, which come in to shore periodically to feed, but spend much of their lives at sea off-shore.
Food, crustaceans, shrimp, fishes and other marine animals often pursued in schools and may run riot in a school of flying fish or squid. Many of movements highly obscure and apparently only fish bearing eggs have been found off Hawaii; that is, ripe eggs. Schools of 2 to 3 different ages usually.	Food is fishes such as mullets, mackerel, bonitos and similar fishes that school. Into these schools the sailfish dash in search of a meal. They are usually taken by sports fishermen, using lures trolled along the outer reefs of the Gulf Stream area. May take feathered lures. Best fishing January to May.	Food is mackerel, flying fish, bonefish, dolphins and similar fishes. Taken on baits, such as cut bait; live bait including whole flying fish, or on artificial lures trolled usually from power boats capable of surviving on the high seas. The fight may be a long one in time and space.	Food is flying fishes, squids, mackerels and similar schooling marine forms. It is believed that they kill food by striking with side-wise motions of the bill before taking it into the mouth. They have been found to eat deep-sea species as well as the surface forms. Taken on fish-baited trolling sets or by harpooning.	Food is fishes such as menhaden, mackerels, sardines, anchovies, silversides and squids, all taken in mad dashes. They are essentially surface feeders, and when actively feeding may break the water. They are among the fastest swimmers of the ocean. They are taken on cut bait trolled, or by use of artificial plugs.
A valuable commercial fish of most erratic abundance. California canned to 22 million pounds a year from 1919-1925, but thereafter less than 1,000,000 pounds a year. In 1938 the albacore came back, and in 1943 the catch in California was 36,000,000 pounds the largest on record. Flesh, excellent.	Essentially a sports fish. A hooked sailfish may leap clear of the water more than a dozen consecutive times, apparently without interfering with a vigorous run, and fight immediately following. The flesh is of poor food value but improves if smoked, and is then considered good.	A spectacularly successful sport fish that provided the writer with at least one afternoon that will never be forgotten, even though it ended in complete success for the marlin and equally complete defeat for three of us who tried to make a landing. Such sport provides a living for many fishermen.	A superior game fish from any angle, and an excellent food fish in which the commercial demand always exceeds the supply. Usually frozen and sold as steaks. Prior to war a normal Atlantic harvest was 2,200,000 pounds; Pacific, 700,000 pounds. 1,600,000 pounds were usually imported from Canada and 2,400,000 from Japan. Liver oil high in vitamin A.	Commercial catch runs about 7 million pounds a year, but while the fish is good food it is not the equal of the related tuna and when canned must be labelled "bonito." They make a fine sporting fish because of their vigorous fighting when hooked. The resource does not seem to be on the decrease.



BONITO



SWORDFISH



WEAKFISH

(Continued from page 27)

picked from a variety that was offered me. Yes, whether you eat in Sloppy Joe's or the Ritz-Statler you will sometimes get seafood, whether you like it or not.

We give cod-liver oil to our children and to our dogs because we say it is good for them. We buy vitamin pills that may have originated in sharks' livers. We wear ear-rings, imitation pearl necklaces made possibly from the minute scales of small sea fishes. We spread fertilizer on our gardens, and some of this may well have come from the sea and contributes to the success of our vegetables. We mend our furniture, repair our books and paint various objects with glues and oils that came in part from marine fishes. We use soaps to wash our faces, oils to soften the leather in our shoes or baggage, and to lubricate our watches. Many of these originated in large marine animals. Cosmetics and perfumes owe a debt to fishes that is rarely recognized, and yet all of these things are dependent on the maintenance of a renewable resource.

It does not seem certain that we are going in the right direction in maintaining this important resource on which our happiness and survival depends. Our rate of consumption continues to rise, and there is no reason to assume that it will lessen. Our methods of wholesale harvesting are becoming increasingly effective and are draining resources that in the past could not be tapped. There is little reason to hope that we will not continue to harvest more effectively whatever resources we have. We can locate fishes by radar, where formerly we located them by luck. We can haul them from depths that heretofore were inaccessible. Helicopters can locate schools of fishes from the air, where a generation ago fishermen depended on ospreys. Only this week, in our own inland lake, the State Conservation Department was photographing the shore line from an airplane because the airplane could discover likely fishing grounds more effectively than could be done from a boat. All of these are ways in which we can more effectively outwit a poor fish and help us win in a competition between us. What can be done to help the fish?

If you will read the chart material in this insert, or the richer literature that is available elsewhere on sea fishes, you will be surprised at the frequency with which you find that little or nothing is known about the means of reproduction of some of them. If we do not know how the species maintains itself, how can we help it? We need more and more research on the lives of these animals that are so important to all of us on Friday, and other days.

Once we do manage to make some progress in this field we will need to know how to put our findings into practice, to the end that we may have more fishes available for the many uses we are discovering for them. This unquestionably will call for international agreement between responsible nations. This means world peace, and certainly that, at present, seems something to hope for but not to attain without effort. It will do no nation any good to discover how a fish reproduces if its breeding ground is made accessible to all, including those who recognize no responsibility in maintaining a source of supply. This means that conservation education on a world basis is really essential to ultimate race survival.

In addition to understanding how and where fishes may maintain their existence by "doin' what comes natcherally," there are things that all of us can do to help. In the management of all biological and perishable resources there is a great gap between the organisms harvested and those consumed. Fishes spoiled by improper handling do no one any good, but serve as a drain on the original supply. Bruised fish spoil more quickly than those that are unbruised, so the fisherman, the fishmonger and the housewife, all have a responsibility. We need more understanding of this problem by everyone. The housewife may learn how to use left-overs profitably in chowders, how to get greater effect from fish when they are used with less expensive foods, how to buy wisely the kinds that will give the greatest value received, and how to judge the fish bought. This should be a part of the school program of everyone who will eventually have to deal with fishes.

Probably the greatest loss at present concerns careless harvesting methods. Fishes taken in great numbers may crush each other in the nets, when they are dumped on the deck, when they are shifted as cargo and on the way to the wholesaler and retailer. Anything that will help these persons who handle fishes to do so more wisely is to the good. We license handlers of many food products. Perhaps the "license" idea should be carried farther in the fish story.

It is obviously impossible here to review the matter covered in the accompanying charts. The material given there, we think, might help in one way or another to a more rational understanding of some large sea fishes. There will be those who will question some of the selections made. They will say, where is the cod, flounder, salmon, tarpon, mackerel, tuna and barracuda. In explanation, it should be said that I have definitely excluded consideration of any species that was similarly figured and developed in my *Fieldbook of Natural History*. I tried to select fishes that had a wide interest, whether

they came from the Atlantic or from the Pacific, and in general I tried to avoid too much consideration of closely related species. If we take the fishes here considered and add them to those covered in the *Fieldbook* we will have a reasonably representative introduction to the ways and values of our more important sea fishes.

The sea fishes covered in the *Fieldbook*, and not here, include the following: Sea lamprey, mackerel, shark, ray, sturgeon, gar, tarpon, alewife, Atlantic herring, American shad, menhaden, Pacific salmon, Atlantic salmon, smelt, common eel, flying fish, seahorse, codfish, flounder, barracuda, mackerel, tuna, bluefish, striped bass and spiny boxfish. If we add the species in this insert to those just listed we have a total of forty-two species on which we have given help. We hope that this will give you a start in understanding a natural resource that affects not only the 25,000,000 fishing Americans but most of the 160,000,000 who eat fish, use soap or otherwise depend in some way on this marine resource.

Speaking of Fish

By OSCAR OSTLUND

When anglers speak of fish,
They, sometimes, falsify;
In big and concrete terms;
So in this poem I shall try
To speak some truth in the abstract:

It seems to me that fishes act
Like men—deep ones have
The confidence and poise;
Splashes on the surface,
Make the noise.

An Extra Tail

By HUGO H. SCHRODER

Photographs by the Author

CHAMELEONS in the United States are ordinarily slender, long-tailed lizards, quite different in appearance from Old World chameleons. They are commonly found from Florida to Texas and the Carolinas.

A friend, a high school teacher in Florida, knowing I was interested in the unusual as well as the usual in Nature, brought me the lizard shown here. It had grown a second tail, upward at an angle from the regular tail. This must have been a nuisance to the animal in its progress through the foliage when stalking its prey.

Our chameleons, *Anolis carolinensis*, are able to change color from greens to browns, but this color change has nothing to do with their surroundings. The males have a peculiar throat pouch which may be expanded at will. It is exhibited during love making, or previous to combat. Often fierce fights occur between males, and the loser may come away minus a tail, so the one here shown may have one left.



Chameleons are strictly diurnal, seek insects for food, and stalk their prey as a cat does a mouse. They are often kept as pets. Normally they drink drops of dew. When kept as pets, their quarters should be sprayed frequently to provide much-needed water for them.

Tourism and Nature Protection

★

An Editorial

★

IN EUROPE they call it "tourism," a term that, with us, covers various kinds of outdoor recreation, including travel to many sorts of areas set aside for their scenic beauty, scientific importance, or recreational value. Whatever the term, or whatever the use, human impact upon the area visited is involved. This impact can be, and often is, detrimental to the original purpose for which the area was set aside.

Recently meeting in Salzburg, Austria, the International Union for the Protection of Nature devoted considerable discussion to the topic "Nature Protection and Tourism." The meeting arrived at the conclusion that: "The natural beauty of a country, including the fauna and flora, becomes, through the growth of tourism, a considerable economic factor, and consequently the protection of nature is a mutual interest of the organization responsible for tourist development and of those concerned directly with nature protection."

As a proper corollary of this viewpoint, it was urged that cooperation be established between agencies promoting tourism, or visitor pressure, and those interested in protection of other values, to the end that they define areas that can best sustain such pressures and those that should be, in varied measure, protected from them. It was recommended that tourist organizations be enlisted to use their influence for nature protection, even to the extent of discouraging the visiting of certain reservations. It was proposed that there be more extensive study of the needs and activities of tourists in relation to nature protection, and the development of an educational approach that would reconcile tourism and nature protection.

Other recommendations were that travel agencies be enlisted "to impress upon tourists making journeys to regions of natural interest the importance attached by the countries concerned to the protection of nature and to the danger not only of destroying rare plants and animals but of injuring wildlife by noise, by fire or by other means." Development of an international code of behavior with respect to Nature was urged, as well as establishment of voluntary wardens to help in protection and education.

Finally, the IUPN recommendations asked for: "Realistic assessment by Governments of the effectiveness and results of existing nature protection and consideration of the possibilities of increasing, or of making more apparent, the connection between economic benefits of tourism and the economic or other sacrifices imposed on the local populations affected by nature protection restrictions. . ."

These are interesting recommendations, not necessarily new except, perhaps, in respect to the idea of drawing agencies that stimulate travel into the educational and nature protection picture. There is, no doubt, a considerable missionary work to be done in this direction. Tourism is, in many places, big business. In some of our States it is a major industry, and considerable sums are spent to attract visitors. At the same time too little thought has been given by travel-stimulating agencies to the effect of tourist pressure on areas that have greater intrinsic values than merely as tourist attractions.

Most of our National Parks fall into that category. They were set aside for a higher purpose than just recreation. Tourist pressure on some of them has become dangerous and damaging, particularly with the National Park Service lacking the funds and the personnel to handle such pressure.

This situation is emphasized in the recent article in *Harper's Magazine* by Bernard DeVoto entitled "Let's Close Our National Parks." In this provocative discussion Mr. DeVoto points to the inadequate appropriations available for park administration and staffing, and the steadily increasing demands upon them. If we cannot protect our parks from progressive deterioration, he urges, then we should close at least some of them so that they may be protected until we can afford to maintain them properly.

Perhaps Mr. DeVoto proposes this drastic step primarily as a means of dramatizing the situation that confronts the National Park Service. Even so, the suggestion makes considerable sense, although it is a sad commentary on the policy and attitude of a country that spends billions for so many other far less constructive purposes.

This extreme proposal, it seems to us, only serves to underline the recommendations of the International Union for the Protection of Nature. Let us enlist the cooperation of those interests deriving benefit from tourism, including travel to national parks. These include railroads and bus lines, oil companies, automobile companies, motels, and hotels, and many others enjoying financial profit from travel. Let us strive for quality in tourist use instead of quantity. Let all those that have a stake in travel join in education against vandalism, littering, invasion of areas outstandingly worthy of protection, and other abuses of our assets of irreplaceable significance. We can have use without abuse, but there must be a better informed and more united front against abuse than there is today.



Moose dwell on the island national park of Isle Royale in Lake Superior, and wolves also were there once, helping to keep a natural balance. Evidence now shows that wolves have returned to the island.

Wolf on Isle Royale!

By D. ROBERT HAKALA

Photographs by the Author

THE condition of the ice in Siskiwit Bay was quite important to Jim and I. We had arrived at Isle Royale, our insular National Park in Lake Superior, only a few days earlier, on February 17, 1952, and had been able to land on the ice in front of camp. It did not appear that the ice was going to hold out long. High seas pouring in from the east, alternating with winds from the west, were causing the ice to break up along the buffeted margin and then move out into the open lake. Conditions in the woods were little better. Even with snowshoes we sank a foot in the soft, deep snow. We had many miles to cover in the month we would remain on Isle Royale for a moose browse and wildlife study. Safe ice along shore would speed our travel to Hay Bay and Crow Point, and, we hoped, to Rock Harbor, thirty-five miles away. The elements were not with us, however, for already all the ice had gone out along the north shore of Siskiwit Bay. Piece by piece the remainder of the ice separated and slowly drifted out into the lake.

The process of a lake reclaiming ice so absorbed our interest, as we wandered offshore near the margin, that we failed to note four gaunt wolves on the ice between ourselves and camp. Even when we turned toward shore, nearly a mile away, we might not have easily picked them out from the shadows of the up-tilted ice cakes, piled up during storms of earlier winter,

if the wolves had not been moving at a lope across our trail. "Four of them!" we exclaimed, almost simultaneously. With our binoculars we saw a big lobo up forward, followed by the female and, finally, two yearling pups—all strung out, 50 to 100 feet apart. Their only interest in us was to get away as fast and directly as possible.

But one of the pups slowed to a trot; then a walk, then sat down for a breather. Mother wolf immediately missed the laggard; stopped and turned back to her tired offspring. Then the two took a short cut toward shore, followed by the other pup and the father wolf, who had also returned to keep the family together. We lost sight of them when they reached the wooded shore, and were not to see any of them again during our month's sojourn on the island.

Wolves on Isle Royale! During the past several years the possibility had often been discussed when park rangers, wilderness enthusiasts, and sporting club conservationists got together.

Certainly the adult wolves of the pack we observed on the ice had been in the park the past winter, producing their litter in the spring. Possibly they had arrived on the island during the winter of 1950-51, crossing from the north shore on the ice, which is known to have extended across the fifteen-mile channel that winter. And I know at least one wolf was on



Wolf tracks found in damp sand at Siskiwit Bay in Isle Royale National Park in September, 1952.

Isle Royale in the fall of 1950.

After a light November snowfall that year, my wife, Jean, and I were hiking to the Greenstone Ridge in the vicinity of the Ojibway Fire Lookout tower, returning to Rock Harbor along the McCargo Cove Trail. The day was superb, the weather crisp, and tramping the woods was an exhilarating adventure. The tracks of rabbit, squirrel, sharptail grouse and coyote were everywhere, showing that park wildlife also was testing the new season. About a half-mile from the harbor, after crossing a black spruce-tamarack swamp, I noted along the trail ahead of us a set of tracks larger than those of any coyote I had seen before. I had no tape with me but, conveniently, my closed hand folded at the second joint to fit into the track, which measured $3\frac{3}{4}$ by $4\frac{1}{4}$ inches. Jean also observed the tracks, but I did not say what I thought had made them since she is a city girl and was adapting herself to northwoods living.

We soon left the island to winter on the mainland, but, with the wolf track in mind, I purchased a supply of quick-drying plaster of Paris in order to be prepared, next time, to make a record.

Strangely enough, no wolf observations of any kind were reported during the entire year 1951. The island was abandoned during the winter—until April, 1952, when National Park Service personnel returned to open the park for the visitor season.

Accompanying the regular Isle Royale National Park personnel, on the season's initial trip to the island, was Jim Cole, biologist from the National Park Service regional office in Omaha, whose assignment was primarily to study moose browse conditions. Shortly after arriving, Jim found wolf tracks, and, independently, Johnnie Williamson, one of the crew members of the

park vessel, *Ranger II*, discovered the same tracks on the trail to Ojibway Tower, within a quarter-mile of my observation a year and one-half earlier. Jim and I recorded this observation, then followed the trail to Lake Richie. Along this trail, which passes by much swampy ground, there were numerous wolf-like tracks, and droppings more than an inch in diameter and a foot long. We took several measurements of stride and track size and made collections of droppings. Wolf, without doubt!

A few days later Jim went on to Siskiwit Bay for the remainder of his browse studies, and I went to my ranger station at Windigo on Washington Harbor. On May 7, Johnnie Williamson, while trout fishing, again, noted wolf-like tracks at a moose wallow on Washington Creek. That evening, plaster under one arm, spoon, bowl and camera under the other, I headed for the wallow. There were

track impressions in pliable soil on the Windigo Mine Trail. I poured casts of these, and of several deep impressions in wet sand along the river. In wet sand one track measured 4 by $4\frac{1}{2}$ inches, and others, on firmer ground $3\frac{1}{4}$ by $4\frac{1}{2}$ inches. The longest pace measured was 28 inches, others in one series were 26, 23, and 22 inches. The animals—apparently more than one since there were smaller tracks—appeared to have been walking or idling about the vicinity of the wallow.

Three of these casts were turned over to Jim Cole to substantiate our findings. One of these ended up at the National Museum in Washington, D. C., where it was definitely identified as wolf. There was now no disputing the presence of wolves on Isle Royale, but until October 2, 1952, no one had actually seen the animals.

On that date I was making a trip to Feldtman Fire Lookout Tower to close it for the season, and to make a general inspection of trails, buildings, and facilities there and en route. The weather was typical of fall—windy, cool, and threatening. Autumn color was at its magnificent peak, reds, yellows and every intermediate shade and hue decorating the trailside. Few leaves had as yet fallen, so the going was relatively quiet.

The trail passed through the second-growth white birch stand with a dense cover of thimbleberry. For a stretch on either side swampy ground nourished a tangle of alders, which would hinder the passage of any animal. Approaching a gradual curve on the thimbleberry-bordered trail, I was startled by two dark backs, visible above the level of the thimbleberry tops, floating up the trail toward me. Stopping, I immediately had the binoculars on them. In a matter of seconds, at forty yards, they hove into full view, halted at

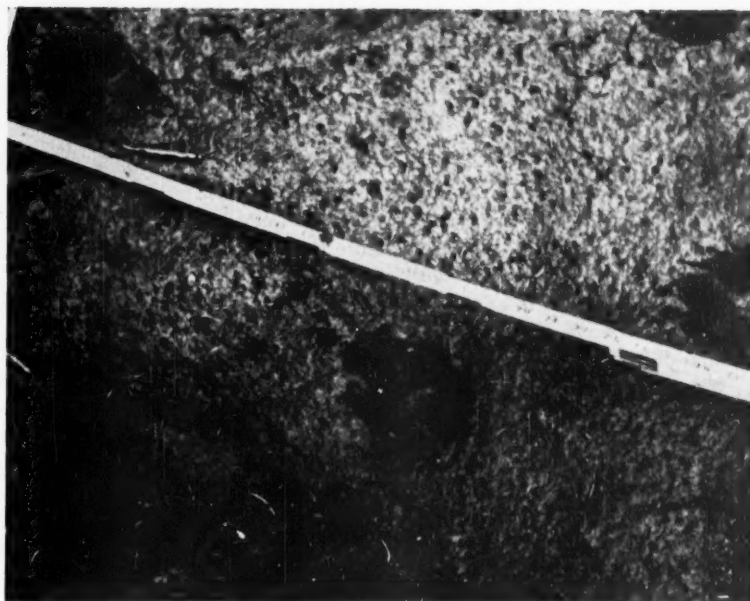
sight of me, and without faltering left the trail at a trotting pace, one to either side. They showed a full gray-to-black broadside, with lighter underparts, before disappearing in the brush.

The animals were large for a coyote, I thought, although the second animal, presumably the female, was considerably smaller. The thimbleberry measured thirty inches, which would make the larger animal around thirty-two inches in height. The head and back were husky in appearance, the ears upright, the tail long and coarse. I was hesitant to accept my own conclusions of wolf identity, so I searched for tracks along the trail over which they had come. I found two measurable tracks that were $3\frac{1}{4}$ by $4\frac{1}{4}$; another $3\frac{1}{2}$ by $4\frac{1}{4}$; another $3\frac{1}{2}$ by $4\frac{1}{4}$.

When I reached Siskiwit Bay and began to follow the gravel and sand beach around to camp, wolf tracks became more common. Many large and some smaller ones were seen in the firm, damp sand. The largest, observed near Senter Point, measured 4 by $5\frac{1}{4}$ inches.

Moose tracks were also frequent along Siskiwit beaches. I observed one bull at Senter Point, and another ambled ahead of me on the beach a little farther on, both in magnificent prime and wearing handsome racks. Much beaver sign was also in evidence along the shore near the Siskiwit River. Fresh cuttings of alder and white birch had been dragged to the harbor, then towed to the river, where a big food pile was in process of accumulation. At one place a tributary drainage had been dammed within thirty feet of the harbor and a fine pond formed around a large house that indicated residence of many years. In such places as this, where brush was dragged overland by the beavers, wolf tracks told a story of stalking. In other places on the beach, wolf tracks of many sizes overlapped one another, heading in every direction, changing direction quickly, running, walking, stopping; as though here a whole pack had been having a romping good time. Walking tracks of moose showed that these animals had passed along this stretch of beach, apparently indifferent to their major predator.

The extent of the control that wolf predation can have on a moose herd is not known. While this aspect of the wolf-moose relationship results, in some quarters, in pressure for extinction of the wolf, I am convinced that all-modifying man is out of bounds in attempting to extinguish any species. The numbers of wolf droppings containing moose hair and bone are no more criteria of predation than of scavenging; they are no more evidence of death by predation than by injury or disease. The carcass of a bull observed on this same trip is an example. This animal appeared to have died



More wolf tracks found in damp sand at the moose wallow on Washington Creek in May, 1952.

of wounds received in a fight with another bull, as evidenced by one deeply split tine and other chipped ones, and wounds in the forepart of the body. No tooth marks, such as would appear on an animal hunted down by wolves, were present.

Our winter study, during which we observed about seventy moose while covering some 150 miles of country, revealed no evidence of wolf predation on moose. In fact, whenever we observed fresh wolf and moose tracks together, each was going in a different direction. This does not mean that wolves do not take moose when the advantage is the wolves'. A likely example of wolf fodder was an old gray cow who was reluctant, at our approach, to leave her dung-insulated bed in the hardwoods. But while we were on the island the wolves patrolled the beaches for fish, hunted the swamps for rabbits, and followed the streams for beavers. In the depths of Siskiwit swamp we once heard them howling as they hunted on the trail of a luckless rabbit. This sound will tingle your blood, and is beautiful in a wild way, particularly the rich baritone of the lobo, easily distinguished in the family chorus.

So Isle Royale has at least four wolves. In addition, Jim and I noted a single track in several places during our winter travels. Then, too, there may have been others at the far northeast end of Isle Royale, which we were unable to investigate. How many wolves can 210 square miles of island wilderness support? Probably an opportunity unduplicated in the world is unfolding at Isle Royale to learn much about both wolf and moose. As a National Park, with well-preserved primeval conditions, Isle Royale provides absolute sanctuary for all native wildlife and serves as an ideal laboratory for the observation of Nature processes.

He Likes Bugs

By ROBERT L. EVANS

MOST people want to get rid of the bugs in their basements, but not James May of Colorado Springs, Colorado. He has more than 100,000 insects, and still gets "bug-eyed" about a new specimen. His is believed to be the largest private collection of tropical insects in the world, representing a half-million-dollar investment.

When I called on Mr. May, I found him at his workbench in the basement, neck-deep among hundreds of glass-covered trays, stacked in tiers and filling the room. Each tray contained twenty-five to fifty mounted insects. Along the wall were hundreds of cigar boxes full of beetles, butterflies, moths and spiders yet to be added to the prepared collection.

"How could one man build up such a huge collection in one lifetime?" I asked.

The insect-collector smiled. "I started early. As a boy I lived in Brazil. When I was eight years old I went on a trip up the Amazon with my father and elder brother, who were collectors of flowers and insects for the British Museum. Then and there I decided to make my own collection of tropical insects."

As a young man, Mr. May spent three years in the Boer War in Africa, and, while in the service, added to his collection. After the war he made an expedition into the Belgian Congo. He spent ten years in the tropics, and then went to Canada as a game and timber conservation officer. For twenty-six years he kept this job, adding to his collection through friends in the tropics.

"Insects of the jungle," he said, "are much larger, most distinctive, and more colorful than our North American specimens. The most interesting species are, perhaps, the silk moths. They can communicate with each other in a manner similar to our radio waves by using their feather-like antennae, or feelers, as the sending organ."

When Mr. May took a live female silk moth out in the country, eighty males collected around the cage in less than three hours. When he cut off the female's antennae, no males gathered, evidently because she could not send forth either a come-hither message or a distress signal.

Some silk moths measure eleven and one-half inches from the top of their wings to the end of their tails.



The head of the tropical lantern fly glows with a red light and its tail displays a green light. Half a dozen of these insects will supply considerable illumination.



James May of Colorado Springs, Colorado, displays one of his many trays of tropical insects. They are a small part of his collection of more than one hundred thousand specimens.

One variety, the Sphinx, is so streamlined that it is reputed to travel 200 miles an hour. It has a wing-spread of nine inches. Other varieties may measure a full foot in width.

An Australian moth in Mr. May's collection has wing tips that resemble snake heads. When it lights in the foliage, it sticks the tips out, perhaps to frighten away its enemies.

Moths differ from butterflies in that they generally have stouter bodies, are less brilliant in coloring and are usually nocturnal in habit.

"A characteristic of different butterflies," said Mr. May, "is that some fly at a low altitude and others keep to the tops of trees. The low-flying ones make a beautiful spectacle among the trees, looking like bright-colored flowers waving in the breeze. The high-fliers are called "bird-winged" butterflies.

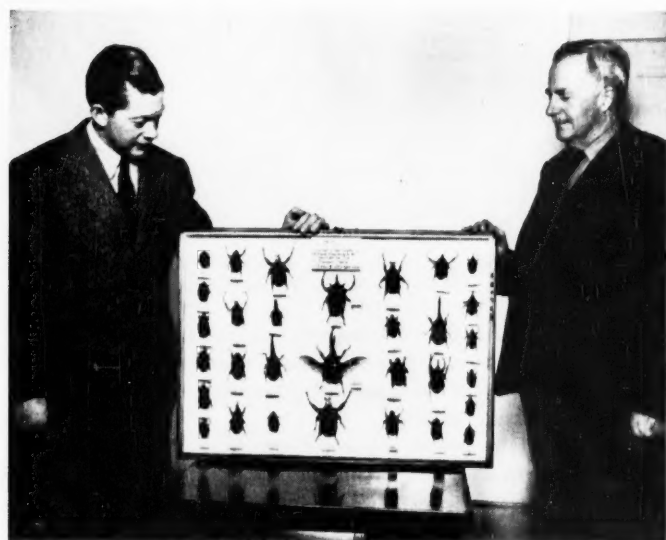
The owl butterfly from South America is one of the

most interesting. Its wing-spread of seven inches is covered with gray markings like those of an owl, even to the large, wide eyes.

The Agrias butterfly is considered the most beautiful in the world. Its colors are a deep velvety red, blue, brown or green. It is extremely rare and very valuable. Mr. May has one that he values at \$300, and which he has never displayed publicly for fear it may get broken.

"I've been told," he said, "that Lord Rothchild paid 3000 pounds for an Agrias butterfly. I've never sold any of my specimens, but sometimes I exchange them with other collectors."

The Morpho butterflies from the lower Amazon are so brilliantly colored that in sunlight they can be seen flashing a half-mile away. "The largest butterfly in the world," said Mr. May "is called the Alexandria. Here is one that measures ten and a half inches across."



The beetles in the May collection are remarkable for their size and varied coloration. The giant Hercules beetles is shown in the center.

But I was more interested in the leaf butterfly from India, which folds its wings to look exactly like a dry leaf and is the same in color.

The beetles in Mr. May's collection seem to arouse more public interest and comment than anything else. Some are so brilliantly colored that one would think they were made of carefully polished gold. The Hercules beetle in his collection came from New Guinea and weighs half a pound. It is nine inches long, has a long sharp snout, and can fly at thirty to forty miles an hour. This beetle has the reputation of being stronger than any other creature in the world for its size.

Mr. May pointed out an elephant beetle. "It gets its name from having a trunk," said Mr. May. "And this Goliath beetle is from the East Indies and gets its name from its great strength. There are beetles resembling the rhinoceros, giraffe and other animals."

I learned that the scarab beetle was once worshipped

by the Egyptians. They thought it was holy because of the crown on its head, which they believed signified the Emperor. The thirty toes represent thirty days in the month, and the female had a heart-shaped nest. Because the female disappears in the earth for three months, it was thought that she sacrificed her life for her young.

Some beetles fly with a terrific burring noise and at a great speed. Their wings are so small and their bodies so heavy in comparison that they can maintain themselves in the air only by flying at great speed.

In Mr. May's collection, there are twenty different kinds of tarantula spiders. The largest, which is ten inches across, comes from central Brazil and spins a web strong enough to catch birds and mice. The tarantula lives by sucking the blood from his captives.

"But here is the fellow that can kill the tarantula," said Mr. May, as he showed me a large wasp measuring five inches across. "It kills the tarantula by stinging and paralyzing it. Other poisonous insects are these centipedes, ten inches long, which have as many as one hundred and seventy-two pairs of legs."

Among the rare insects of the world, I learned, is the stick insect from East Africa, whose spindly body and great long legs look just like dry twigs. Some change color with the seasons, and all fold their wings like a fan.

Some of the largest grasshoppers are to be found in Mr. May's pin-ups of the insect world. Some have purple underwings, marked with orange and red. They have a wingspread of from nine to ten inches. Some have extraordinarily shaped heads, with a red thorax like a turkey comb. Others resemble the large army ant. The horse grasshopper makes a noise like a horse drinking.

"The natives of South America," said Mr. May, "don't have to worry about electric light bills. All they do is catch a number of lantern flies, place them in a bottle and hang them up in their huts. These insects have a red light on their heads and a green or white light on their tails. They can turn their lights on or off at will."

In collecting his specimens, Mr. May used several devices, the most common being the net. But for the high flying butterflies he used the ingenious method of intoxicating them. "I make a quick 'micky' of liquor and molasses," he said, "and spread this mixture on the bark high in the trees. The butterflies lapped at it, got drunk and dropped to the ground."

"Another method I used was to shoot them with a 410 shot gun, using shells loaded with dust shot, or sand. The shot, or sand, was so fine and soft that it did not injure the delicate wings, but the charge was strong enough to knock the butterflies out so they would fall to the ground."

"Many large insects are caught early in the morning when they are sluggish. Large grasshoppers can bite,

so I catch them by the back, or corner them and force them into a poison bottle."

Insects, I learned, are killed by placing them in a jar of potassium cyanide. Then each specimen is laid on a piece of paper, which is folded in a triangular shape. Information regarding the insect is noted on the paper. In the tropics, these specimens are then kept in a box lined with tin to keep out the ants. Camphor in the box keeps them from being destroyed by other organisms.

The insides of the large insects are removed and a wool stuffing containing arsenic is placed in the cavity. The insects must be handled carefully so as not to break the outside skin or they are spoiled as specimens.

Mr. May's insects are transported to the United States in cigar boxes lined with soft padding. He pays no duty on them since they are for scientific purposes and not a commercial product.

Started as a hobby, it has only been in recent years that exhibitions of Mr. May's remarkable collection have been made. In Winnipeg, Manitoba, Canada, more than half the population, an estimated 124,000 people came to see it. The collection has also been shown at the Grand Central Palace in New York, the Chicago Flower Show, the Denver Stock show and at many other places.

Mr. May has specially built, three-by-two-foot glass show cases in which he mounts the insects in family groups. At the present time he has 475 full show cases. When on display, these are placed at a 45-degree angle on collapsible stands. A 32-foot trailer and a 3-ton truck are used to haul this display around the country. No charge is made for viewing the exhibit. But the free-will offerings have made it possible to continue the public exhibitions.

The question most frequently asked by visitors upon seeing this display is: "Did you catch and mount all these insects yourself, Mr. May?"

Mr. May has mounted all the insects in the collection. However, others have helped in getting the specimens. "I now have a man in New Guinea doing some collecting for me," he said. "And my brother in Rio de Janeiro also collects and sends me specimens. On the side, I do a little bug trading with other collectors."

John May, son of James May, is responsible for the public exhibition of this marvelous collection, in which the whole family has played a part. Mrs. May and another son are also collectors. "We are a buggy family," said Mr. May.

The second most frequent question asked by visitors is, "What is your collection worth?"

"It's hard to value a life's work in terms of dollars," said Mr. May. "Most collectors with irreplaceable objects value their holdings at a million dollars, so mine is worth at least that much."



The owl butterfly is a spectacular insect and is shown here in an insect setting.

Mr. May's collection is so unusual that an entomology professor at Colorado Springs, with thirty years experience in the field, said Mr. May has specimens he did not know existed.

Many people ask about the dangers encountered in the tropics. According to Mr. May, the mosquito that carries malaria or yellow fever is more dangerous than any other insect. Mr. May himself contracted malaria in Africa. His father died of the dread yellow fever.

When asked about unusual experiences, Mr. May tells about one Brazilian trip. It had been raining for weeks. One night, he and his companions came upon a deserted cabin and decided to make camp. Too wet and tired to build a fire, they crawled into their bedrolls. Presently they heard a noise, and striking a light they found the cabin was infested with centipedes and huge tarantulas that had evidently come in from the rain. The cabin was given back to them and the hunters slept outside.

Due to limited space, the Mays can display only a third of their entire collection of 100,000 tropical insects. They are now building their own private museum in Rockcreek Canyon, ten miles south of Colorado Springs. As soon as it is completed, the specimens in Mr. May's basement will be moved to a new home.

Hubbubery in the Shrubbery

Two cats are bent on mutual slaughter;
Their raucous screams turn blood to water.

By RUTH SEYMOUR VESELY

Bird-loving man, whose aim is neat,
Turns hose on fighters. PFFFT! Retreat.

"Anting"— Outside and Inside the Windowpane

By ADA
CLAPHAM GOVAN

Illustrated by Herom



The catbird was lying on the small of its back, its tail unnaturally thrust up between its legs.

ONE stifling day in June, 1945, I replenished the birdbaths and small pool in our yard, hoping to revive the jaded parent birds that had been showing up day after day, tails drooping and beaks half open, evidently suffering badly from the heat. Glancing out of my window a short while later, not a bird could I see. Then I saw an agitated bunch of slate-gray feathers tumbling about in a slight depression beside a bird-banding trap, and finally made out two wings partly open and a bird's head that jabbed repeatedly at one wing and then the other in a futile effort to rid itself of some torment. In between jabs the bird drove its beak into the ground as it wallowed helplessly from side to side. It was a catbird lying on the small of its back, its tail unnaturally thrust up between its legs as it floundered about. Mites? Lice? Something seemed to be eating the bird alive before my horrified eyes!

Suddenly the tormented creature rolled to its feet, shook itself, then streaked for the birdbath. There I saw a bird that normally hops, start walking slowly, all scrooched down, round and round in the basin. As it breasted the water, small dark objects dropped into the ripples, some scarcely wiggling, others paddling like mad. Ants! Mrs. Catbird had been robbing an anthill, and when the critters swarmed over her she had sought relief in the birdbath. It was as simple as that! Or so I thought then; and my relief was almost as great as hers, as horror gave way to lively curiosity. Apparently ants had crawled even beneath her wings, for she probed for them spasmodically, carefully stripping her primaries after each probe.

Finally the catbird stepped up on the rim of the basin and shook herself

vigorously. Then, to my great disgust, she darted straight back to the leafy depression and, in the blink of an eye, she lay there, striving to balance herself on the base of her tail, which had somehow worked up between her legs, while ants by the score—an army of ants—streamed over her! Again she wallowed from side to side, her head desperately darting, probing, stroking first the primaries of one wing, then the other, until no longer able to endure it. Then came another plunge into the birdbath, but, after the cooling off period, back she streaked to the ants. I watched her do it five times; then my endurance ran out. I hurried to the scene of trouble, scared Mrs. Catbird away, and discovered the biggest ant migration I had ever seen.

An inch-wide ribbon of living creatures was crossing the road, marching down our yard, and over Mrs. Catbird—until I scared her off—up and over the banding trap, on and on. And almost every ant carried in its mandibles a fat white egg. A host was on the march. Ten minutes later the final stragglers were not yet in sight. No wonder that, for a gourmet's feast like this, Mrs. Catbird was ready to pay—and pay! But did she differ greatly from human kind who deliberately dine on delicacies that bring in their train cramps and heartburn as the inevitable aftermath?

Six months later, the Jan. 1946, issue of *Nature Magazine* printed a story by H. Roy Ivor of Erindale, Ontario. He called the article "Anties of Bird Anting," and it explained the mystifying actions of my catbird the previous summer. Also he proved beyond question that things are not always what they appear to be, even when they are faithfully recorded. Mrs. Catbird had not been tempting Providence; she had been "anting," the act



Suddenly the bird shook itself and streaked for the birdbath.

of a bird picking up an ant and rubbing it so quickly on the underside of the outer primaries or the tail, that it is difficult for the eye to follow. But even Mr. Ivor, who had witnessed this odd behavior many times with many species, could not explain why birds anted, any more than could M. Abbott Frazer, who in 1876 made the first known reference to it.

As foster mother of five orphaned rosebreasted grosbeaks that have lived with us, uncaged, since they were only a few days old, I have been privileged to see many unusual sights. But it was beyond my wildest imaginings that "anting" should now invade our family circle via a glorious friendly fellow named Jiggs, and a black, neurotic scamp known as Moses. It came as a surprise that the placid Jiggs should be the first to succumb to instincts long dormant. Although both birds are of the same species, and only a year apart in age, they are completely dissimilar in looks, mentality and temperament. For Moses is erratic, clever, impish, and filled from beak to tail with nerves so sensitive that he seldom enjoys a peaceful moment. Neither do we! His head feathers undulate as rhythmically as do the waves of the sea, while it takes something momentous to raise so much as a ripple on the silken smoothness of Jiggs' handsome head.

Jiggs was just four years old when, on a June day in 1946, I heard a peculiar clicking coming from our kitchen. There, on a wide counter, I discovered Jiggs, and he was duplicating Mrs. Catbird's behavior in every motion save that his rolls were far more violent due to the flat, shiny counter, which gave him none of the side support Kitty got from her soft, leafy depression. I had to flip Jiggs on to his feet before I could see the ants, as small as grains of sand, and, I feared, almost as numerous. For Jiggs had sighted the vanguard and that gave me time to combat what was soon to follow. The "clicks" were Jigg's beak striking the linoleum counter every time he grabbed an ant, and, although it was a shame to spoil his sport, an invasion by ants demands drastic action. Two months later, Jiggs discovered a second invasion just as it came under the kitchen door and again I broke up his anting, this time with ants that were big and black.

In late October, 1947, I found a horde of weevils in the oatmeal I used as a breeding base for the mealworms I raise for birds. As I dipped the infested meal out of the big porcelain pan into a smooth crockery bowl nine inches deep and ten inches across, Jiggs flew down to oversee affairs. The weevils fascinated him

and I was not surprised when he slowly lowered first one foot and then the other into the weevil-laden meal. But I was amazed to see him change in the next few seconds from a warm, friendly creature into an automaton with wide, fixed eyes drained of all expression. Every mechanical movement seemed according to rote, as if he were striving to recall, from out of the dim past, the tradition he was to uphold and the proper

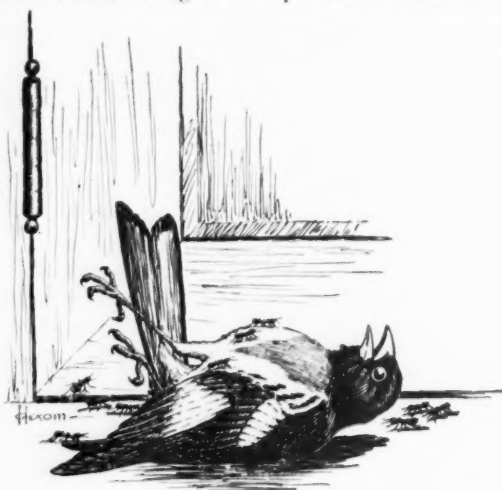
way to do it. The bowl's curve just fitted the small of his back and the fact that weevils had to play the part of ants in this drama seemed not important. His tail, thrust up between his legs, lay almost against his abdomen, as, for the first time, Jiggs "anted" to his heart's content. Soon the powdery oatmeal had turned him into a snow man, even his beetling eyebrows were dusted white, while his brilliant shield paled into faint rose. At last he scrambled to his feet and shook himself, but his wine-brown eyes still held that trance-like stare. The next moment found him down on his back again, anting with

might and main. I thought he never would tire.

Perhaps I am foolishly glad my Jiggs had his big day. A few weeks later, on December 3, an obstruction in his windpipe made it necessary for us to give our beloved pet his everlasting sleep. He had graced our home just five and one-half years.

I never understood why the over-sensitive Moses regarded ants merely as appetizers while they induced in Jiggs a complete transition. But Moses was only biding his time. As for the rest of the quintet, Stubby, its matriarch and a stout-hearted little spinster of twelve years; Lane Peter, a year younger, and Ezekiel, malformed and seven years old—they all regard ants as good eating, nothing more, but they flee from an onion. Yet the five have lived together all their lives, and on only two of them has formic acid in any form had repercussions. Song birds are not supposed to have a keen sense of smell, but from early July, 1948, let one slice of onion show up in our kitchen and like a wraith, Moses would evolve apparently out of the small black stovepipe leading from the gas heater, and from that stance would crane his neck to keep track of every slice as it dropped in the pan; his crest operating rapidly, as if turned off and on by electric motor. It was a mania that developed full-grown and overnight.

On July 28, Moses swooped down, stole an onion slice from right under my knife, zoomed up to his stovepipe perch, and the fun started. Apparently the acrid fumes from the onion had finally roused in him the long dormant instincts that ants brought out in Jiggs.



Lying on a linoleum-covered counter, the rose-breasted grosbeak was imitating the anting antics of the catbird.

And, indeed, a slice of raw onion practically covering one's face is a potent thing, which Moses now learned the hard way. He wept, gasped, gagged, blew bubbles through his nostrils, ran forward with it, leaped backward with it, stood on tip-toe and stretched to rise above it. In fact, he did everything to rid himself of the onion save drop it. And drop it he would not! In between maneuvers he scrambled frantically for a firmer grip on the pipe so he could roll over on the small of his back, although in his half suffocated condition it was taking every ounce of his stamina to remain on the pipe at all. However, the few lightning swift strokes down his primaries that he did manage to get in, were unmistakable. Was this captive

wildling anting with an onion because it was the best substitute on hand, or did the acid in the onion satisfy Moses better than the ant's formic acid—if acid is the answer to anting?

I was sure Moses had now reached the zenith of all anting, but I did not yet know my Moses! April 20, 1953, Moses, now almost ten years old, mounted his stovepipe, as usual, to watch me slice an onion into a tiny saucepan four inches deep and barely five inches wide. I turned my head just long enough for him to leap into the pan, give a convulsive flop on his back and then collapse. He was folded up, end to end, and so tightly wedged he could not "ant" a feather. His distress was so evident I hurriedly got out the big skillet, and, just as an experiment, poured Moses and his onion into it. Never before was "anting" demonstrated as



Moses swooped down, stole an onion slice from under the knife and zoomed up to his stovepipe perch.

Moses did it that day! He returned again and again to his skillet and I laughed till I ached. In one respect he differed from Jiggs and the catbird. His tail always juttied up the outside of his right leg, never outside the left leg, between his legs or near his abdomen. The catbird was not near enough for me to see her eyes, but the eyes of both Jiggs and Moses were wide and expressionless; not half closed, as Mr. Ivor portrayed his birds. Wild or tame, every bird is an individual and seems to have a way all its own.

At long last, Moses fluttered to the sink and clung there, beak half open, misty eyes now almost shut, snowy breast with its lovely scarlet shield, heaving and heaving. But that phase ended abruptly. A ringing whistle startled me as a feathered

bomb zoomed past me. Moses was himself again.

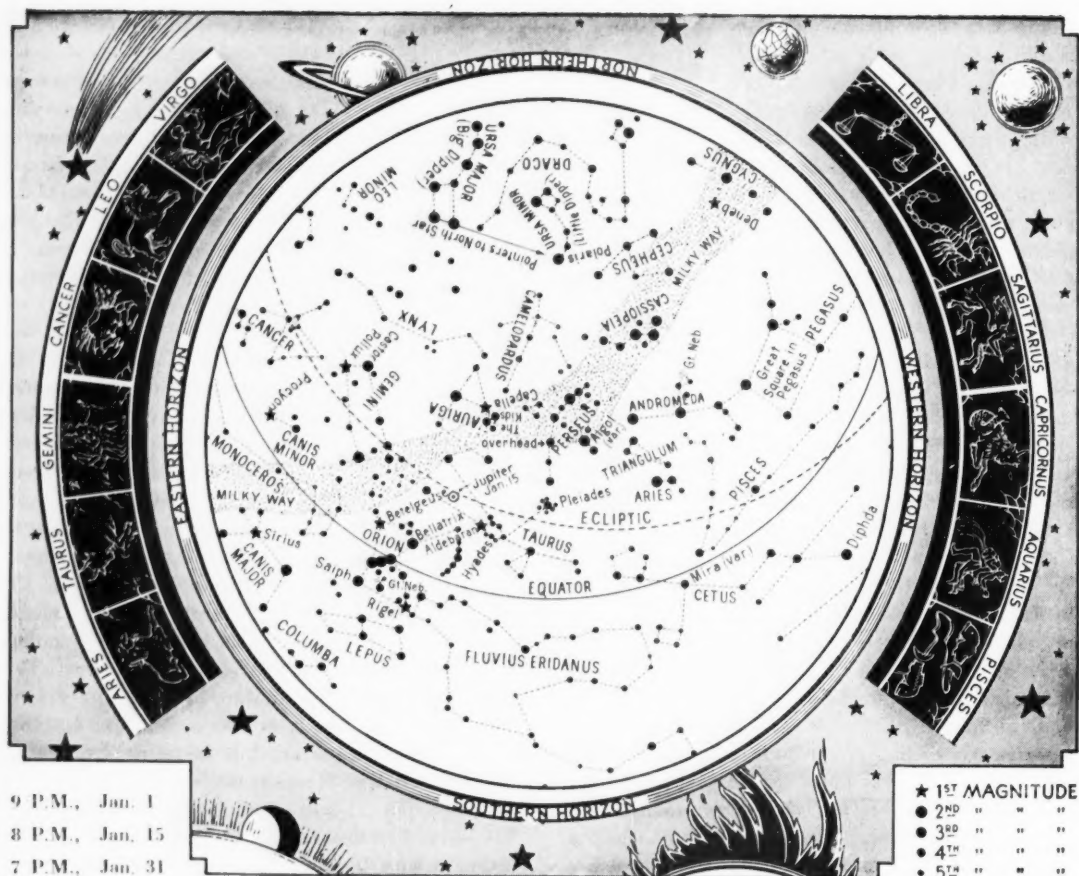
Later, I discovered him fresh from a very wet bath, standing on the table craning his neck in a vain search for the skillet. His crest was on end and he was pop-eyed with anticipation, but he came straight to my hand. Here was Moses at his best, lovable and as clean as a new pin. I laid my cheek against his glossy side. He smelled to heaven!

"Into that bath again or we won't be able to live with you!" I exclaimed, hastily holding him at arm's length. Perhaps I hurt his feelings. Perhaps Moses did not like smelling like an onion, either. But something sent the black scamp scurrying for the old dripping pan, and as the water billowed and foamed about him I wondered what Mr. Ivor would say to "anting" as done inside the windowpane.

Shifting Shadows

By LOUISE D. GUNN

When I was small and sick in bed,
With thumping noises in the head,
My mother, answering to my call,
Would make with shadows on the wall;
With hands held high before the light
She drew black magic from the night,
Her fingers, thumb, and palm of hand
Designed a silhouetted hand:
A rabbit twitched two pointed ears
That wiggled till the happy tears
Erased the pain behind my eyes.
A fox, a duck with quacking cries,
Were shifting shadows in my room
And with the rabbit swept the gloom
Away from me, a child in bed,
With thumping noises in the head.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Heavens in 1954

By ISABEL M. LEWIS

AMONG the outstanding celestial events that may be predicted for the year 1954 will be the favorable approach of Mars to the earth and the occurrence of five eclipses. Two are annular eclipses, another a fine total eclipse of the sun, and the other two are total and partial eclipses of the moon. There will be, also, a continuation of the sunspot minimum period, attended by various indications of low solar activity, such as less frequent outbursts of intense ultraviolet radiation from the sun and less interference with radio waves in the earth's atmosphere. Radio reception generally is best during this period of minimum solar activity. There has been a marked decrease in the number and intensity of magnetic storms and auroral displays from those of the sunspot maximum years. The sunspot minimum type of solar corona, which should be seen during the total phase of the

eclipse of June 30, 1954, will have long equatorial streamers and short, bushy polar rays. These rays extend to either side of the sun's magnetic poles and are in strong contrast to the intensely brilliant and more evenly developed sunspot maximum type of corona seen six years or so ago.

On June 24, 1954, Mars will be at its most favorable opposition since July, 1939. The next following opposition of September, 1956, will be even more favorable, but there will follow a long period of increasingly less favorable oppositions. The most favorable oppositions of Mars occur only at intervals of 15 or 17 years. The date of nearest approach to the earth is usually not on the day of opposition but several days before or after, because the inclination of the plane of the planet's orbit to that of the earth affects the distance. In 1954 Mars comes nearest to the earth on July 2, more than

a week after the date of opposition. Mars will then be slightly less than 40 million miles from the earth. In 1956 it will approach several million miles closer to the earth. The closest possible approach of the planet to the earth is a little less than 35 million miles.

For several weeks preceding and following the date of opposition of Mars it will be an object of spectacular splendor in the night sky. At opposition its brightness will equal that of Jupiter at his greatest brilliancy. Mars will be in Sagittarius from early April to late October, and its far southern position in the summer of 1954 means that it will be observed at its best in the southern hemisphere. It will be low in the southern sky as viewed from northern latitudes, but, even so, it will be a magnificent object within that little inverted milk dipper configuration of stars in Sagittarius conspicuous in the night skies in June and July.

Early in January the brightness of Mars will be less than that of a star of first magnitude. As always, it will be ruddy in color, visible in the southeastern sky for several hours before sunrise. On January 1 its distance from the earth will be about 171 million miles. Its increase in brightness and decrease in distance will be rapid during the winter and spring. By early May Mars will be a brilliant equal of Canopus, second brightest star in the heavens, and by the end of May it will be as bright as Sirius, the brightest of all the stars. From January 1 to June 1 Mars decreases its distance from 171 million to about 47 million miles, passing rapidly through Libra and Scorpio into Sagittarius. At its best in June and July, this fascinating planet then will be closely scrutinized and photographed by astronomers all over the world. It will be the object of greatest popular interest in the heavens, more admired and discussed than any other planet.

By the end of October Mars will have passed to the western evening sky. On October 28 it will be on the meridian, due south at sunset. It will be then in Capricornus and more than 90 million miles from us. Although greatly decreased in brightness, Mars is, even so, as brilliant as Arcturus or Vega early in November. At the end of the year Mars will be in Pisces, in the western sky at sunset. Its distance has increased to more than 132 million miles and its brightness has fallen off until it is only a little brighter than Aldebaran, in Taurus, a star it somewhat resembles in color. Two years from now Mars will again receive a warm reception from our space-conscious inhabitants as it draws near for another close approach to our planet.

Two of the five eclipses of 1954 will occur in January. The first will be the annular eclipse of January 4. This eclipse will be visible in the Antarctic regions and at the South Pole. Its northern limit passes south of Australia, but New Zealand lies within the eclipse

region and southern parts of the Indian and South Pacific Oceans. On the central line of the annular phase, which passes over Antarctica, there will be at one point an annular eclipse of the midnight sun.

On January 18-19 there will be a total eclipse of the moon. The eclipse will be visible generally in Europe, Africa, the Arctic regions, North America, except the extreme western and northwestern parts, South America, and the eastern part of the Pacific Ocean. The moon will enter the earth's shadow, and the partial phase of the eclipse will begin, on January 18 at 7:50 P.M., E.S.T. The moon will pass completely into the earth's shadow, and the total eclipse will begin at 9:17 P.M. The total phase of this eclipse will last only about one-half hour, the moon beginning to leave the shadow at 9:47 P.M. By 11:14 P.M. the moon will be completely out of the shadow of the earth and the partial phase of the eclipse following totality will end. The times of the various phases of the eclipse are all given in Eastern Standard Time. Subtract one, two, or three hours to obtain the time of the same phases in Central, Mountain, or Pacific Time respectively.

The total eclipse of the sun of June 30, 1954, will be visible over all of North America, except most of Mexico and the Southwest and western part of the continent. It will be visible in the Arctic regions, North Atlantic Ocean, Europe, and all of Asia except the far eastern and southeastern parts, and in northern Africa. The total phase of this eclipse is visible within a long, narrow path beginning in Nebraska, where the umbral shadow of the moon touches the earth at sunrise. It passes over Minneapolis soon after sunrise, passes into Wisconsin, and across the northern peninsula of Michigan and Lake Superior to southern Canada, across the provinces of Ontario, Quebec and Labrador to southern Greenland. The eclipse passes to the south of Iceland, grazing the southern coast; over the Faroe Islands to Norway and Sweden; across the Baltic Sea to north-eastern Europe and Russia. It crosses the Caspian Sea to Asterabad late in the afternoon, leaving the earth at sunset in India. The longest duration of the total phase of this eclipse will be 155 seconds and will be near noon off the coast of Norway near Bergen. This will be an interesting and scientifically important eclipse. Members of a number of eclipse expeditions will endeavor to make observations at widely scattered positions within the path of the total phase.

A partial eclipse of the moon, in which four-tenths of the diameter of the moon will be covered by the earth's shadow at time of greatest eclipse, will occur on July 15. It will be partly visible in the eastern and southeastern parts of North America. The moon will be above the horizon from the beginning to the ending of the eclipse over Europe, Africa, Antarc-

(Continued on page 52)

Nebula in Andromeda

By DANIEL SMYTHE

Between the mighty stars there runs
This flame from off a million suns.
It veers at last to the earth's arc
And makes us ponder here in dark.
Beyond the fever of our world,
A faint, translucent light is hurled;
But we turn back to strife and wars
That have no meaning to the stars.

The School Page

By E. LAURENCE PALMER

Professor Emeritus of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

FISHES IN SCHOOL

SOME years ago I received from Dr. Allan Abbott of the English Department of Columbia University a little note that I am sure is appropriate for use on this page, and I have Dr. Abbott's permission to use the material. It indicates that his philosophy and sense of humor is, in my judgement, much like mine.

It seems that Dr. Abbott was asked, by what he called "the typical school teacher," to help write a "lesson plan" for teaching Henry Van Dyke's "Fisherman's Luck" in school. Before letting you read further here, I must ask that any of you who have not read this gem of Van Dyke's sit down and read it. Without such background, you can hardly appreciate Abbott's "lesson plan," so I do not hesitate here and now to give you a little preparatory homework.

Now that probably none of you have followed my directions, let us go "on with the show." If you have not followed my directions, it is your loss, not mine. Here is what Dr. Abbott gave the teacher when she returned for the lesson plan.

Outline for Teaching Van Dyke's "Fisherman's Luck:"

Purposes:

1. To enjoy the experience of reading the essay.
2. To share this enjoyment with a social group.
3. To enjoy vicariously the experience of fishing.
4. To create something which shall express these satisfactions.

Aims:

1. To learn about trout-fishing.
2. To learn about other kinds of fishing.
3. To learn the value of fish as food.
4. To learn about the economic importance of fishes.
5. To learn about the place of fishes in secular and religious history.
6. To learn the effect of fish and fishing on language.
7. To learn to manipulate fish—living, dead and cooked.

Objectives:

1. Vocational opportunities and needs in fishing; is it a blind alley vocation?
2. Wise use of leisure: what wise men have fished?
3. Health: food value of fishes; vitamins in cod liver oil.
4. Home Making: preparation and cooking of fishes.
5. Social-civic: Fisheries in colonial days; in the Revolution in connection with arbitration. How we always won.
6. Religious and ethical: Jonah; miraculous draught of fishes; the fish as a religious symbol; keeping Lent. Kindness to fishes.

Big Objective: To Realize the Place of Fishes in the Modern World.

Goal: The Fish-centered School.

Activities (Leading to further activity)

- Unit I. (fusion with Science) Make and care for an aquarium.
- Unit II. (fusion with Home Economics) Prepare and serve: Creamed codfish-boiled salmon-fish chowder.
- Unit III. (fusion with Commercial Education) Study the mail-order ads of Frank E. Davis, and make better ones.
- Unit IV. (fusion with language) Make a list of such expressions as "poor fish," "gudgeon" (obs.), "sucker."
- Unit V. (fusion with library work) Cut out all the pictures of fishes from books in the library and paste them in a notebook.
- Unit VI. (fusion with handwork) Make a seine of all the available string. (Creative group-project for the entire class through the term).

Unit VII. (fusion with Composition) Write a letter to Dr. Van Dyke, presenting to him the seine, scrap-books, chowder, aquarium, etc., and inviting him to address the school.

My letter from Dr. Abbott assures me, in all seriousness, that shortly after this outline got reasonable circulation he was approached by a publisher who wanted him to elaborate it into a book on "Progressive Education."

Over the years I have enjoyed passing this lesson plan out to "stuffed shirt" educators and noting how they took it. I have not as yet designed a score card that would give me objective data on which I could evaluate an educator by this means, but I am sure that it has greater possibilities than some of the tests that have been presented for consideration.

To me this little gem of Abbott's ranks with Benjamin's "Saber-tooth Curriculum," with Sharp's "*Eornis pterovelozi gobiensis*" and I might even include some tests that have been handed to us as works of merit and which have received widespread sanction by the great and near great. Unfortunately, what I think is funny is taken seriously by others.

I agree whole-heartedly with Abbott's general philosophy. One cannot reduce a masterpiece such as Van Dyke gave to us to a lesson plan. Why not write a lesson plan for the "Twenty-third Psalm," or "Ave Maria," or "The Blue Boy"? There are some things that just do not take that kind of analysis, just as there are some individuals in the teaching profession who feel that the rule of thumb must be followed in all things. These persons should not be allowed to teach. They are neither artists nor scientists in the realm of teaching. They are simple (and I mean simple) automatons. They are like those "educators" who now say that we probably will not be teaching reading in the schools because the public of the future will be educated through radio and television. Think what doors would be closed, and even slammed, on those who, in the future, cannot read. Think what an opportunity for the dictator such a situation would present. Why do educators not oust such morons from the profession? Cannot educators appreciate what it means to have the power to go it on your own and to have open for your use all the doors of growth and enjoyment that are provided by literature, art, music, religion, and just plain friendship? There is something in this world that is represented by the communion of human beings of common convictions, common ideals and common abilities. But such communion is impossible if the individuals involved have nothing to give. Rupert Brook in his poem "The Voice" reduced masterfully to words the differences between persons of the "lesson plan" type and those capable of making the most of what the world has to offer; those who can become masters of their fate and captains of their souls. Schools without leaders who can see these facts are futile.

The study of fishes in school can be hopeless and I rather think it usually is. There is something about fishes besides anatomy, smell and statistics. If the school does not induce its patrons to want to know more about, let us say, fishes—or for that matter any other element of our environment—then it is failing in its mission. I do not urge that everyone learn to fish and that everyone should fish. There just are not enough fishes to go around. I do urge, however, that everyone should do his part to help mankind solve some of the problems associated with fishes. Schools can help children learn to interpret the behavior of even such common fishes as goldfish. We can demonstrate rather effectively what mastery a fish may have of the senses of seeing, hearing, feeling, tasting and even of doing something like smelling. Some of these things can be demonstrated in an ordinary fruit jar, provided it is filled with fresh water not formalin, or some other preservative. Possibly some youngsters can, through their studies, get experiences that may help them some day to understand fishes and help them to prosper. But along with this mundane aspect of the situation should, I think, go a little of Henry Van Dyke, a little of the Barefoot Boy, and a whole lot of trying to understand fishes. I once foolishly tried to reduce this idea to the suggestion that there be a unit of study called "living with fish and other cold-blooded animals" only to have a widow friend of mine ask me "who wanted to live with a cold blooded animal, anyway." She was right. My ability to

express what I had in mind was weak but I do know that knowing fishes can bring happiness, wealth, health and satisfaction to many persons. As possible agencies for reaching these desired goals they should not be overlooked in our schools, but please be sensible about the paths you follow to get to these goals.

White Marigold?

For more than twenty years W. Atlee Burpee Company has conducted extensive breeding projects with marigolds. They have produced marigolds in a wide variety of colors ranging from palest primrose to deepest orange. Thus far, however, a white marigold has eluded the breeders. Man-in-the-Moon, a marigold offered for the first time in 1953, has come closest to the goal, but it is not pure white. Burpee wants such a marigold so badly that an offer of \$10,000 is made for the first seeds that will produce pure white marigolds, as white as Burpee's Giant Fluffy White Aster or their Snowstorm Petunia. Specializing in this plant, this seedsman had about given up once in its search for a marigold with odorless foliage, then word came from a missionary in Tibet that he had such a seed, and that mutation begat the Crown of Gold marigold, a flower of an entirely new shape and the first marigold in cultivation without the usual pungent foliage. So keep an eye open for a pure white mutation; it may be worth a small fortune.

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Camera Trails

By

EDNA HOFFMAN EVANS

I FIRMLY resolve, in this New Year season, to try to take better pictures and to make fewer mistakes than I did during the year that has just been completed.

It is a good resolution and I plan to try to stick to it. But whenever I use the expression "take better pictures," I remember a talk I once heard at a Camera Club meeting. Said the speaker at that time, "A photographer does not take good pictures, he makes them." He meant, of course, that good pictures do not just happen. The photographer must make his pictures good by seeing that the conditions conducive to good pictures are present, and by taking full advantage of every one of them.

On the other hand, mistakes are not voluntary, but they do happen just the same. Mine happen particularly when I get excited, or careless, or fail to observe all the multitude of details on which good photography depends.

Thus, with these thoughts in mind, perhaps I should revise my New Year's resolution to read as follows:

"I firmly resolve, in this New Year season, to try to make better pictures, and at the same time to keep as many mistakes from happening as possible in the coming year."



The young hawk sits with open beak as though panting in the April sun. This picture was taken on April 25.

In spite of all this, however, I do think there is an uncontrollable element—call it luck, chance, or whatever you wish—that also enters into the process of making Nature pictures. Wild creatures cannot be controlled as studio properties are, nor can factors like weather conditions, light, shadows, and others that play a major role in Nature photography.

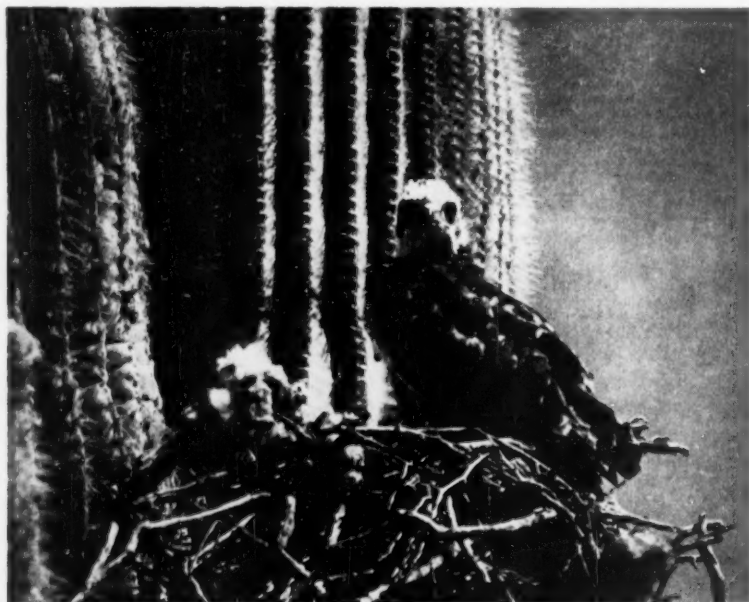
For example, I am extremely proud of the results I got with some young red-tailed hawks last spring. I photographed them as they sat on their rough nest of twigs and sticks in the crotch of a giant

saguaro cactus. But, if I had not been lucky enough to find that nest, and if one of the big branches originally supporting the nest had not broken off a short time before I arrived on the scene, and if the saguaro had not been growing on a steep slope so that I could stand on the ground and shoot across to the nest—well, it was just a lucky combination of circumstances over which I had no control. My job was to take advantage of the opportunities that were virtually handed to me on a cactus platter.

Red-tailed hawks are fairly common in Arizona, according to most ornithological authorities. However, there is some confusion on details of classification, particularly since the resident sub-species is slightly different from the migratory sub-species that travels across the State twice a year. Apparently, the native red-tailed hawks have lighter underparts; their tails, however, when seen from above, have the same typical rufous-red color that has given the species its name.

I first met my hawk family on Sunday afternoon, April 19, when I was hiking over a stretch of rocky, rolling desert not far from the old Vulture Mine, west of the town of Wickenburg. The young hawks were quite small then, and covered with soft, fuzzy white down. As I approached the big cactus in which their nest was built I heard the parent birds uttering their shrill "keeeer-r-r" cry from the distance. They came nearer and nearer, circling high overhead, obviously nervous and concerned. One of the adult birds, I do not know which, had lost some of the long primary feathers from its wings, giving it something of a ragged, moth-eaten appearance.

The parents circled overhead for a time, so high that they were little more



By May 10 the young hawk is almost completely clothed in feathers. The remains of a jack rabbit's leg dangling from the nest gives mute evidence of the hawk's bill of fare.

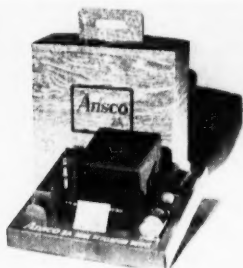
than specks in my camera's groundglass. Finally they soared away. Perhaps they had decided, when I made no attempt to molest their nestlings, that I was harmless.

The young birds, on their part, did not seem overly concerned about me, although they never looked away from me while I was watching them. There were two young hawks in the nest. A third, I found upon closer examination, lay dead at the foot of the saguaro. It had not been dead for more than a day, but what had killed it I was unable to determine.

That day, as luck would have it, I had only my 35mm camera, loaded with color film, with me. I took some pictures, but realized that without a telephoto lens the results would not be too remarkable. Oh, how I hoped the birds would be there on the following Sunday.

They were. This time, you may be sure, I carried all the equipment I could—big camera, little camera, telephoto lens, and tripod. It was a good long hike across dry washes, up hills and down, over rocks and prickly desert vegetation.

The week had wrought changes in my hawks. They had grown considerably and brown feathers were beginning to appear through the white down on their backs and wings. They sat with their beaks open, as though panting in the April sun. This time I took a variety of pictures, although only one of the young hawks would pose. The other crouched unsociably in the center of the nest so

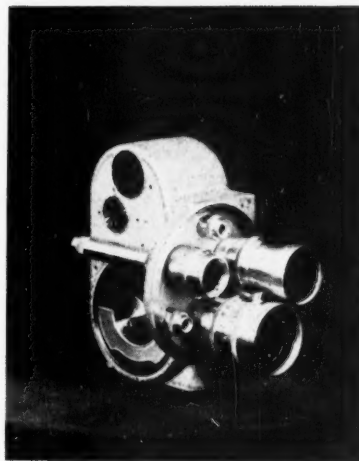


The Ansco 2A home developing kit.

that only a few feathers showed above the edge. I shouted, whistled, waved my hat, and even tossed a very tiny pebble or two so that they dropped into the nest. In spite of everything the camera-shy young hawk refused to move.

This time the parent birds seemed less concerned about my activities around the big saguaro. One bird, the ragged one, made a pass or two high overhead and screamed its shrill "Keer-r-r" once or twice. Then it sailed away and disappeared beyond a hill top in the distance.

Two weeks elapsed between my second and third visits to the nest, and by May 10 I found the young hawks almost completely clothed in feathers. Their body feathers seemed much darker than those worn by their parents. But they had the same strong, hooked beaks, the same wide, fierce eyes that mark the hawk clan

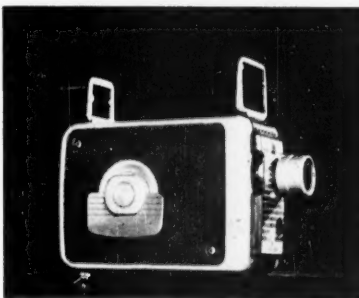


The Bell and Howell 8mm. tri lens motion picture camera.

everywhere. Gone were all the soft, babyish characteristics that they had possessed three weeks previously. The dry, furry remains of a jack rabbit's hind leg, which dangled over the edge of the nest, gave mute evidence of what the young hawks liked for dinner.

At first both birds sat up and posed obligingly. I used the 35mm camera and took some satisfactory color pictures, with the blue Arizona sky in the background and the prickly green of the saguaro as a frame. But, alas, when I changed cameras and started to take black-and-whites with the Graflex and telephoto, one bird squatted down out of sight once more, leaving only a single young hawk to pose for me. I waited a long time in the hot desert sunshine before giving up for the day.

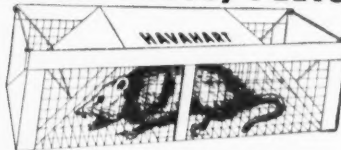
The next Sunday, the fifth week since I had first located it, I found the nest empty and the young hawks flown. As I approached the deserted saguaro, one of the young birds flew up from a perch on a jutting rock and soared away into the distance, the sunlight glinting on its fan-shaped tail where the feathers did not as yet show much promise of the rich red color that would come with adulthood. As I watched him go I wished that young hawk good luck, good speed, and even good hunting. In a way I envied him his flight, his grace, his sureness of wing, and his young, proud



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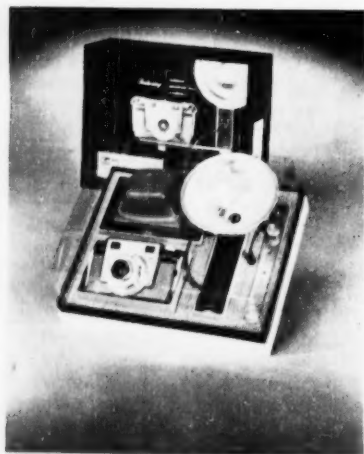
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fearlessness—and I was grateful for the chances I had had to photograph him.

I wonder where he is today, as a New Year begins, and when hawks are once more beginning to think of nest building and the rearing of young. I hope, as the spring progresses and birds nest again that once more a lucky combination of circumstances will bring subjects my way that are as interesting and as readily photographable as were the young red-tailed hawks last April and May.



Eastman's new Kodak Bantam RF camera.

NEW CAMERAS—As 1953 drew to a close, a number of new camera models were placed on the market. Some of them were, of course, aimed at the Christmas trade. But cameras are a staple product and, even though Christmas has passed for another year, they remain available to those who want them.

In the movie field, Bell and Howell has given a "new look" to two of its 8mm spool load motion picture cameras, the 134-V (single lens) and the 134-TA (tri lens); the cameras are now available in a fawn metallic finish to match their companion piece, the Regent 8mm projector. In addition to the basic fawn color, the footage counter and speed dial on these cameras are finished in dubonnet while the circular area that frames the winding key is maroon. Besides this addition of color, both cameras have lenses equipped with click stops for easier, surer setting. The price remains the same, \$89.95 for the single lens and \$129.95 for the tri lens model.

Eastman has announced a new, extra fast f/1.9 lens for its Brownie movie camera; the older f/2.7 lens will also continue to be available. With the new, faster lens, home movie makers should be able to get shots of indoor sports events and well lighted dramatic presentations; subjects not available to slower lenses. Price of the Brownie with the new lens is \$49.50.

In the still camera line, Ansco of Binghamton, N. Y., has prepared five new camera-flash outfits covering a wide

variety of price ranges and camera types. Each of the five outfits contains a camera, flash unit, film, and flash lamps. Several also include camera carrying cases and gadget bags. Lowest priced of the five is the Ansco Shur-Flash outfit No. 4, which sells for \$9.75; next is the Ready-flash camera outfit No. 4, priced at \$13.95; and third is the Flash Clipper No. 4, which sells for \$24.95. The DeLuxe folding camera outfits offer a choice of Ansco Speedex or Ansco Viking cameras and accessories, the least expensive combination being priced at \$57.72. The most expensive outfit, priced at \$197.34, features Ansco's luxury 35mm camera, the Karomat, or the Ansco Regent, also a 35mm camera.

In the kit line, Ansco has a 2A home developing outfit that contains all the essentials for home darkroom work—contact printer, red safelight, two-way safelight with yellow bulb for printing and red filter for film developing, trays, film clips, glass graduate, chemicals, and contact paper. The kit is priced at \$9.75.

Eastman's combination kits, designed especially as gifts, include the Brownie Hawkeye flash outfit, priced at \$13.95; the Kodak Duaflex outfit priced at \$21.95; and the Kodak Duaflex deluxe flash outfit priced at \$32.45. The kits include such additional items as flash holder, guard, bulbs, batteries, film, and booklets of how-to-do-it photo tips. Other new Eastman cameras include the Kodak Bantam RF, priced at \$78.50; the Brownie Holiday at \$4.25 and, at the other end of the price scale, the Kodak Chevron at \$215.00. Ask your dealer to show you these new models.

STAFF OF LIFE— PERUVIAN STYLE

(Continued from page 18)

seeds are broadcast or set in rows, then crudely covered with soil by dragging thorny branches over the field. Germination is rapid, despite light frost and scanty rainfall.

The shallow-rooted plants are thinned and weeded by hand, and when mature (in five or six months) are cut and allowed to lie in the sun for several days. The Indians thresh the grain by flailing it, and separate the chaff by winnowing. The yield is good—one-quarter to one-half ton of grain per acre. In 1938 Peru alone produced 12,500 short tons on 35,000 acres.

And quinoa, the ancient, is still the Indian's diet staple. He eats it raw with sugar or water, cooked as a mush or a thickening for stews, or happily combined with cheese and peppers. He burns the leaves and stems to an ash, making a masticatory for the omnipresent coca leaves which he chews the way Americans chew gum.

Naturally this remarkable plant has intrigued the inquiring scientific mind.

Dissected in the laboratory, quinoa turns out to be, principally, 38 percent starch, 5 percent sugar, 19 percent protein, 5 percent fat. It is roughly the equivalent of wheat in protein and mineral content, but markedly lower in carbohydrates. None of this would interest an Andean Indian in the least. He knows, as he has known for centuries, that quinoa gives him strength for the mountains he must climb, the bitter cold he must endure, the hard life he must lead.

The two double handfuls of quinoa seeds I bought at the Pisac market reached my kitchen safely. We have eaten them boiled in broth and have found the somewhat chewy texture not unlike that of wild rice. Cooked long and slowly in a double boiler, quinoa makes a flavorful mush that does nicely browned in butter and served with maple syrup. But of its virtues as a dispeller of "corrupt humours" I still know nothing.

But I do know that I am much closer than I was to that long gone time when Atahualpa, the last Inca king, fought against the Spaniards and lost both his life and his empire.

Resources

Resources and The American Dream. By Samuel H. Ordway, Jr. New York, 1953. The Ronald Press Company, 55 pages. \$2.00.

This is a significant little book that should be required reading by every leader in public life, in industry, labor, education and social and economic leadership. Mr. Ordway is less apprehensive of population pressure than he is of the drain upon the world's natural resources by industrial expansion. He rejects what he calls the "Cornucopian" belief that the earth can continue indefinitely to yield raw materials to satisfy that economy and an ever-increasing standard of living. His chapter on "The Good Life" as it has evolved through the generations since the first pioneers came to North America is a fine statement, worthy of reading and rereading in the light of our economy of today. Mr. Ordway believes that the good life—the American Dream—can be realized, but only if we can adapt and adjust to the indisputable facts of limits of growth, and limits of raw materials. Here we have basic thoughts on conservation presented in straightforward fashion.

London Gardens

Old London Gardens. By Gladys Taylor. New York, 1953. The British Book Centre, 194 pages. Illustrated. \$4.50.

Any gardener who visits London is, of course, lured to some of its historic gardens, public and private. Some of these exist only in history, others, including the royal gardens of Hampton Court, Kensington and Buckingham Palace, still fascinate the garden lovers. In this book the author delves into garden history and gardens of the present in a charming manner.

A Beautiful Book

Wild Flowers of America. With reproductions of 400 paintings of flowers in full color; 380 by Mary Vaux Walcott; 20 by Dorothy Falcon Platt; introduction and detailed descriptions by H. W. Rickett. New York, 1953. Crown Publishers, Inc. \$10.00.

There is not, it is safe to say, any lovelier book about American wild flowers than this one. Traveling widely over North America with her husband, Dr. Charles D. Walcott of the Smithsonian Institution, Mary Vaux Walcott painted from nature every wild flower that she could find. After a quarter-century more than 400 plates had been completed. Between 1926 and 1929 these were engraved, printed with loving care by the late William Edwin Rudge, and sold in limited editions in portfolios. Thus their distribution was limited to the relative few who could afford them.

Now we are indebted to the publishers of this magnificent book for making these plates available to many who have coveted them. Mrs. Walcott's splendid plates have been augmented by a score from the accurate and able brush of Dorothy Falcon Platt, and H. W. Rickett of the New York Botanical Garden has supplied an introduction, a glossary, and excellent popular descriptive text about each flower pictured. Reproduced by lithography by the Duenezwald Printing Corporation, which is headed by Ralph M. Duenezwald, who was associated with the original reproduction under Mr. Rudge's direction, the plates have suffered little through reproduction. Comparison with one of the original portfolios reveals, here and there, some loss of sharpness and occasional diminution of color values, although it would be carping to suggest that this is more than of minor significance. This is in all ways a work that will be widely acclaimed and universally welcomed. R.W.W.

The Gran Pajonal

The Rivers Run East. By Leonard Clark. New York, 1953. Funk and Wagnalls. 366 pages. Illustrated. \$5.00.

The Gran Pajonal is a vast rain forest, a jungle land of fast rivers and savage inhabitants. It lies east of the Andes of Peru. The author of this fascinating story of exploration was convinced that there were to be found the Seven Cities of Cibola, a legendary place sought for several centuries. With a minimum of equipment and a lone companion, Leonard Clark dared the jungle that had taken many lives of explorers similarly bound. He found what he sought. He also discovered many species of plants and animals that may, in some cases, be new to science. The author has written more than just a story of jungle adventure and exploration. He has written a book that should take first rank among such writings.

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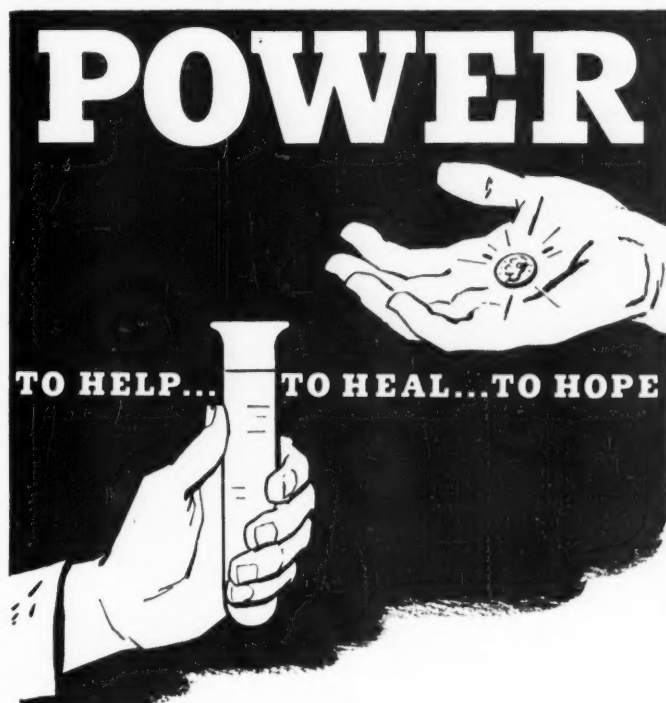
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THE HEAVENS IN 1954

(Continued from page 45)

tica, the Atlantic Ocean and South America.

The last eclipse occurring in 1954 will be an annular eclipse of the sun on December 25. Then the annular phase of the eclipse will have a maximum duration of 7 minutes, 40 seconds in the Indian Ocean, midway between South Africa and Australia. The path of the annular phase will pass over the extreme southern part of Africa from latitude about 30 to 33 degrees south, and then will cross the Indian Ocean without touching land until, near sunset, it will pass over several small islands directly northwest of Australia. Partial phases of the eclipse will be visible over much of South Africa, the Philippines and most of Indonesia, and also part of Antarctica.

In 1954 the planet Mercury will be seen in the evening sky most easily around the dates of its greatest eastern elongations. These will fall on February 13, June 9, and October 5. It will be seen to the best advantage in the morning sky shortly before sunrise near the dates of the greatest western elongations, which will fall on March 28, July 26, and November 14. Venus will start the year low in the eastern morning sky. It will be at superior conjunction with the sun on January 29, and lost to view in the sun's rays for some days before and after that date, at which time it passes to the evening sky. The planet's position in the western evening sky will improve during the spring and summer, until it will be at its greatest distance east of the sun on September 6. It will be at greatest brilliancy in the evening sky October 11. On November 15 Venus passes to the morning sky at time of inferior conjunction with the sun. It will remain in the morning sky for the rest of the year, and will be at its greatest brilliancy there on December 21.

The appearance of Mars, and its motion through the heavens in 1954, we have already considered. Jupiter will start the year in Taurus, north of Orion, a brilliant object in the evening sky. In June it will be drawing too close to the sun to be seen in the twilight and will be in conjunction with it on June 30, passing then to the morning sky. On October 22 it will rise about midnight, and after that date will be rising earlier each evening for the remainder of the year.

Saturn starts the year in Libra, visible in the southeast before sunrise. It will be in conjunction with Mars on January 2, when Mars will be about one degree south of Saturn. At the end of January Saturn will rise about midnight. On the date of opposition, April 26, it will be on the meridian at midnight and visible all night. It will appear in the evening sky until November 4, when it will pass to the morning sky after being in conjunction with

the sun. Lost to view in the sun's rays for some days before and after this date it will next appear in the morning twilight.

Avalanche Advice

Intended primarily for forest officers that may have responsibility for the safety of skiers, "Avalanche Handbook" is a 146-page, illustrated publication of the U. S. Forest Service that will be of interest to others concerned with skiing activity. Snow Ranger Montgomery M. Atwater and Forest Supervisor Felix C. Koziol of Wasatch National Forest in Utah are primarily responsible for the preparation of this handbook, a copy of which is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for sixty cents.

Refuge Leaflets

Last year some four and one-half million people visited the national wildlife refuges administered by the U. S. Fish and Wildlife Service of the Department of the Interior. While many of these were gunners taking advantage of shooting opportunities on those refuges, on parts of some of which shooting is permitted, there has been an increasing number of visitors enjoying other recreational activities, including observation of the wildlife. To meet the public need for information about these areas, the Service is preparing a series of leaflets. The first is entitled "Visiting National Wildlife Refuges," giving data on the areas, how to reach them and the best times of year to visit them. Leaflets are also available on specific refuges, including Wichita Mountains Wildlife Refuge in southwest Oklahoma; Cape Romain National Wildlife Refuge near Charleston, South Carolina; Bear River Migratory Bird Refuge in Utah; Mattamuskeet National Wildlife Refuge in North Carolina.

Duck Stamps

Each year the sales of the migratory bird hunting stamp, or duck stamp, seem to climb, and the sales reached a new high for the fiscal year ending June 30, 1953. A total of 2,296,628 stamps were sold, an increase of 128,861 above the previous year's sales. Most stamps were purchased in California, with 214,456 sold. Other States selling more than 100,000 were Minnesota, Texas, Michigan, Wisconsin and Illinois. Revenue from these stamps is used to help finance the Federal Government's waterfowl refuge and enforcement program. Many philatelists also purchase these stamps, 12,987 having been sold by the Post Office Department's Philatelic Agency last year.

Science Reader

Scientific American Reader. New York, 1953. Simon and Schuster. 626 pages. \$6.00.

Turning back through the 7 pages of *Scientific American* for the past five years,

the editors of that distinguished publication have chosen outstanding articles in several fields for inclusion between the covers of this fine book. Gradually man is finding answers to various scientific enigmas, or is coming into new knowledge. This appears to have been the measure applied to the selection of the articles for presentation in book form. Several sections are supplied, these entitled "Evaluation in Space," "Structure of the Earth," "Structure of Matter," "Atomic Energy," "Origin of Life," "Genetics," "The Virus," "Stress," "Animal Behavior," "Origin of Man," "The Brain and the Machine," and "Sensation and Perception." Under each heading there are from three to six outstanding contributions by leading physicists, geneticists, psychologists, chemists and astronomers. Thus there is presented a tremendous wealth of excellent scientific writing and notable scientific information.

The Sea

All about the Sea. By Ferdinand C. Lane. New York, 1953. Random House. 148 pages. Illustrated by Fritz Kredel. \$1.95.

This is an "Allabout Book" in a series being brought out by this publisher and directed at the 9 to 12 audience. Actually, of course, it is an introduction to the sea, whence it came and what it holds, since no one as yet has accomplished the task of telling *all* about the sea—or probably ever will. The author, who has written extensively about seas and sea life, presents highlights of marine life in good popular text, and, in contradistinction to most juvenile books, provides a good index.

How to Draw Birds

Drawing Birds. By Joy Postle. New York, 1953. Pitman Publishing Corporation. \$1.00.

With the reproduction of many pencilled sketches and accompanying brief text, the author and artist responsible for this little book, the title of which is descriptive, provides some elementary instruction in bird drawing. There is no intention of trying to turn out an accomplished bird artist but use of this booklet will at least give one an opportunity to discover whether he or she has a flair for this sort of drawing. And it will help any bird student who may wish to make sketches of birds in the wild.

Rabbit Story

When Will the World Be Mine. By Miriam Schlein. New York, 1953. William R. Scott, Inc. Illustrated by Jean Charlot. \$2.25.

This is a "Young Scott Book" that presents the story of a snowshoe rabbit for the young reader, the quite young reader. The text is ample for the audience sought and the illustrations are imaginative, perhaps too much so for the youngster, who will gain only a hazy idea from them as to how a snowshoe rabbit looks.

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A MINERAL COLLECTOR'S GUIDE TO WYOMING 25c. Gritzer's, Mesa, Arizona.

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UNDER THE MICROSCOPE

By JULIAN D. CORRINGTON

STUPOR MUNDI

WHERE the calf of the Italian boot bulges out into the Adriatic, a famous monarch was born in 1194. This was Frederick II, emperor of what there was left of the Roman Empire, king of Sicily, of Jerusalem, and of Germany, patron of science in general, medicine in particular, and more or less expert in anatomy, zoology, mathematics, architecture, poetry, languages, and philosophy.

This extraordinary man came to be known in his day as *Stupor Mundi et Incandulor Mirabilis*, the world's marvel and constant wonder. Born at Jesi, near Ancona, he was chosen as German king at Frankfurt two years later and crowned king of Sicily at Palermo when but three and one-half years old, continuing the Hohenstaufen line that began with Conrad III in 1138. His grandfather was Frederick I, surnamed "Barbarossa."

This takes us back into the middle of the era of the Crusades, with Jerusalem alternately in the hands of the Saracens and Christians. If you saw the recent motion picture, *Robin Hood*, you will recall the dramatic return to England of Richard the Lion-hearted, which occurred in the year that Frederick II was born. During his lifetime Gengis Khan was establishing the empire of the Mongols, but died as he was about to overrun Europe. St. Francis of Assisi became a famous monk and preacher and founded the Order of Franciscans, and the Spaniard, St. Dominic (Domingo de Guzman), initiated the Dominican Order. The Mamelukes took over Egypt, King John of England was forced to grant the Magna Charta, while the odious Inquisition was established only fourteen years later in less liberal surroundings. Roger Bacon was a celebrated English monk and philosopher and the probable inventor of spectacles at the time of Frederick's death in 1250. Only fifteen years later, Dante Alighieri was born at Florence. Such was the setting in which *Stupor Mundi* played his part.

In the eleventh edition of the *Encyclopaedia Britannica* there are five columns devoted to the military and political comings and goings of Frederick, and they read like some mad dream. He was alternately at peace or war with a succession of Popes, being excommunicated and then reinstated on occasions too numerous to recite. Likewise with the Lombard League, the cities of northern Italy never being sold on his omnipotence; likewise with a large number of other rulers, great and small. Presumably

it was all very real and important to those then living — and dying; but history of this sort, in retrospect, is like the constant nursery bickerings of spoiled and sulking children. The strutting and the fanfare may have affected rich and poor alike, but meant nothing for the advancement of knowledge or of civilization.

It is a relief, then, to turn to the bare 22 lines of the *Britannica* that give us a brief glimpse of Frederick the man. Nordenskiöld and other historians of biology mention this Hohenstaufen monarch with reference to his cultural aims and achievements, items that far outweigh and outlive the vainglorious conquests and coronations.

In Lacera, near his court at Foggia, in the spur of the Italian boot, *Stupor Mundi* lived in oriental fashion and splendor, maintaining a harem fully equipped with wives, concubines, eunuchs, and all the trimmings, including numerous offspring, both lawful and illegitimate, some of each of whom he raised to positions of prominence and power. He probably wished to be considered as an absolute monarch, as a great soldier and lawgiver, and he did, in fact, bring peace and prosperity to shattered Sicily. But it is as a patron and participator in cultural and scientific studies that we can admire him most.

In Naples, Salerno, and other cities, but more especially in Foggia and Sicily he welcomed learned men of all creeds and nationalities and fostered scholarly pursuits of many kinds. Michael Scott or Scotus translated Aristotle and Averroes under the direction and patronage of Frederick, forming the basis for much of the work of later savants. To Frederick came Leonardo da Pisa, introducing Arabic numerals and algebra to western civilization. Known to posterity more generally by the name of Fibonacci (the son of Bonacci, his family name being Leonard Bonacci) this man wrote a number of works that were destined eventually to overthrow the cumbersome old Roman numeral system, requiring the use of an abacus for problem solving. It took three centuries and more to accomplish this change, so there is hope that English-speaking peoples of both hemispheres may yet have the sense to adopt the metric system and that all countries may one day see calendar reform in practice. Leonard was the foremost mathematician of the Middle Ages and took part in a celebrated mathematical tournament arranged by Frederick, himself no mean student of this subject.

Dante tells us that Italian poetry was born at Frederick's court. The ill-fated Pier della Vigna, once all-powerful, here wrote the first sonnet; but he was blinded, impoverished, and driven to suicide when Frederick's power declined. Troubadours and minstrels of Europe here fraternized with Arabian and Jewish bards and singers. Frederick himself wrote lyrics in Italian that are still preserved. He is said to

have been conversant with six languages.

The Emperor's chief literary production was a book on falconry, still available, *De arte venandi cum avibus* (*The Art of Hunting with Birds*), which not only shows his acquaintance with Aristotle and other classical authors, but contains a great deal of original information on avian anatomy and observations on the habits and migrations of birds. From the manuscript a first printing in Latin appeared at Augsburg in 1596, and there is a later German edition published at Berlin in 1896.

The other manner in which Frederick is of importance to present-day students of biology is through his patronage of medical instruction. Nordenskiöld says that he "founded a school of medicine at Salerno, where for the first time since Alexandrine days human bodies were dissected." The latter statement is true but the first certainly cannot be, as Salerno was known as a medical school as early as the 9th Century, although its first beginnings are uncertain. Generally regarded as not only the first school of medicine but also as the first university, this institution is of such historical import as to merit separate attention later in these columns. The Emperor Frederick did much to assist Salerno, not only permitting but also encouraging or even requiring dissection of the human cadaver in medical instruction. This liberal attitude was of immense significance, directly so for professional studies, indirectly as fostering original investigation for all science disciplines. Perhaps unwittingly he did the school a great disservice, however, when, in 1224, he founded a university in nearby Naples, after which time Salerno began to decline. Doubtless it is this Neapolitan college to which Nordenskiöld had reference.

A magnificent tomb in the cathedral at Palermo, Sicily, houses the remains of *Stupor Mundi*, strange mixture of East and West, of barbaric and modern, and of politics, arts, and sciences.

NEW TRIARCH CATALOG

GEORGE H. Conant, Triarch Products, Ripon, Wisconsin, has issued *Catalog No. 10*, a 54-page illustrated booklet on microscope slides, sent without charge to teachers of biology. Formerly known as strictly a botanical supply house, Triarch now has a division devoted to items for the zoologist, including general zoology, histology, and embryology. The company is most famous for its botanical offerings and particularly for slides of parasitic fungi and reproductive stages of higher plants.

The current listing incorporates new arrangements and features many sets of slides for designated courses or special purposes. New entries appear here and there throughout the booklet. Of interest to specialists are three items not yet available in sufficient quantity to warrant listing in this catalog. These are: slides for Foster's "Practical Plant Ana-

tomy," *Lilium regale* pollen mother cell smears, and *Sphagnum* protogametes. Write Triarch for further information.



Miss Marilyn Monroe inspects the new CinemaScope lens.

FAMILY ALBUM

7. Projection Lenses

WHAT is it that Bausch & Lomb has that other optical companies do not have? When we looked at the accompanying illustration we asked ourselves this question, and, of course, the answer was at once apparent—the new CinemaScope lens. We have chosen this specimen to exemplify projection lenses in general because it is the most recent and because the illustration reveals so much as to its construction. The reader will note the beautiful proportions, the tapering body, the molded curves of this lens, with its elegant modern finish. It is one of the first delivered to 20th Century-Fox studios in Hollywood out of an order, placed by Spyros P. Skouras, dynamic president of the organization, for three thousand projection units and two hundred-fifty camera or taking units.

The famous Rochester optical company was given only eight and one-half months

to complete this huge order, and had to devote a large staff and several buildings or floors exclusively to this special task. The taking units fit B & L Baltar camera lenses and squeeze a wide image on 35 mm film. Then the projection units, attached to B & L Super-Cinephors, or other projection lenses, expand and flash the image on wide curved screens, giving the illusion of depth without the use of viewing spectacles. Screens vary from fifty to sixty-five feet in width, depending on the size of the theater. That at the Roxy, New York, is sixty-five feet, for example.

CinemaScope is not stereoscopic, as "Byzna Devil" and "House of Wax," requiring the wearing of special glasses, and it uses only one projector, unlike Cinerama, which employs three synchronized projectors. In both CinemaScope and Cinerama, sound is directional or "stereophonic," engulfing the audience from multiple outlets behind the screen. The sound follows the action and comes from that area of the screen where the action is taking place. Mr. Skouras reports that there are already 2522 theaters planning to install CinemaScope, here and abroad, and doubtless many more will follow as conversion is relatively inexpensive, involving only the lens, the screen, and rewiring for sound.

At present 20th Century-Fox has scheduled all of its releases in CinemaScope. Included are "The Robe," the four million dollar biblical drama; "How to Succeed in Business Without Really Trying," starring Marilyn Monroe, Betty Grable, and Lauren Bacall; "Prince Valiant," and others.

The object of our scrutiny in the accompanying illustration is technically not a lens at all, but an objective, consisting of a five-element lens system. We should like to propose a new designation for this sort of appliance, and call it a *projectire*. The computing of ray tracings for this complicated system would have required many months if performed by hand, even with modern desk calculators to do the math, but was punched out on high-speed IBM electronic equipment in an unprecedented three weeks. Night and day work, seven days a week, then followed to tool up and lay out for the huge task of pouring, molding, pressing, grinding, polishing, fitting, mounting, and assembling all the parts of this objective, and the first deliveries were made ahead of schedule. The whole story is a fine example of American know-how and energy. We are indebted to *Balco News*, house organ of the Bausch & Lomb Optical Company, for these facts and figures.

For those who have not been paying attention we will say that they probably are right, and that after sixteen years of dull and prosaic items in this Department, it is time we livened things up with a bit of cheesecake, for which our thanks to you know who. But we would still like to find out what B & L. has that others lack!

SUCCESS STORIES

ELEVATION to vice-presidencies was the reward for two top executives of the Bausch & Lomb Optical Company recently. Lyles B. McKinley, who hails from Pittsburgh, Kansas, and graduated from Kansas State Teachers College in 1925, represented B & L in various mid-western and eastern areas from 1929 to 1942, then coming to Rochester as assistant inspector for military instruments. In 1946 he was appointed administrative assistant to the vice-president of the Scientific Instrument Division, and a year later became this division's sales manager. Here he stepped up activities and fostered new products, held important offices in several associations, and now is made vice-president in charge of Scientific Instrument Sales.

Carl A. Day joined Bausch & Lomb in 1931, upon graduating from the U. S. Naval Academy. After a year of factory training, he was assigned to the Scientific Instrument Sales Division, but in 1942 transferred to the Manufacturing Division. He coordinated production of optical gunfire control instruments for the armed services, including range-finders, heightfinders, and binoculars. Later Mr. Day was works manager of all Rochester manufacturing, production control, and plant maintenance activities for the company, then established the spectacle frame plant at Wellsville, N. Y., and completed development of the lens plant at Midland, Canada. Now, at 45, he becomes vice-president in charge of manufacturing.

POSTMOR TEMQUOTES

Herewith a further disquisition on ours of recent date showing what could have happened had the Poets and Authors been histologists:

Lewis Carroll:

"I sent a message to the fish;

"Please stain these sections as you wish."

"The little fishes of the sea

Were freshly out of H & E.

"The little fishes' answer was,

"We're using Bismarck Brown, because..."

Through the Looking-Glass

Kipling:

Walk wide o' the Widow at Windsor,

For 'all o' Creation she owns;

We 'ave bought 'er the same with the sword an' the flame,

An' we've salted it down with our bones.
(Poor beggars!—it's black an' white with our 'aversion systems, periosteal lamellae, canalicular, an' our perforatin' fibers o' Sharpey!)

Barrack-Room Ballads,
The Widow at Windsor,

ON THE VALUE OF ASAM

THE following letter will prove of interest to those readers who followed the fortunes of the American Society of Amateur Microscopists, as well as to former members of that organization. Its writer was a member for many years:

Dear Dr. Corrington:

I thought it would interest you to know that the recent AIBS meetings in Madison, Wisconsin, were attended by at least three past members of the ASAM and each of us had papers to present.

I recognized the name of Alan Heilman and introduced myself to him after his paper had been presented. He recognized my name on sighting my name-badge and we were off into a pleasant and somewhat nostalgic discussion. I did not get a chance to introduce him to Richard M. Klein, who I think was the first member to hit the "Big Time" with an abstract published early in *Stain Tech.* I had met Klein at the summer conference at the Brookhaven Lab. where he presented the outstanding paper of the conference. Both of these men were in agreement with me as to the part played by ASAM in guiding us along scientific pathways. It was an important part of our background—and I for one, think that it was the factor of being available to me at the right time that made it mean so much to me.

Since this was so much a part of your life while it was in its heyday, it must be told to you now that it has carried its values farther than perhaps you have been led to think. I for one, shall always keep in mind the example set by the basic idea I saw in ASAM, and fulfilled by the presence of the ex-members at Madison, — and I am sure at future meetings of national scientific groups.

I hope, some day, that I can do as much to give purpose and direction to people in science.

Sincerely,
Eric Christensen
Medford, N. Y.

BOOK REVIEWS

Acarology

A NEW book of great importance for the microscopist is *An Introduction to Acarology*, by Edward W. Baker, Bureau of Entomology and Plant Quarantine, U.S.D.A., and G. W. Wharton, Duke University, outstanding authorities on mites and ticks. This is the first new work on these important animals in a generation, the only one in English, and the only one in any language that presents keys to all the 228 families.

Mites affect each of our lives in one way or another. A startling new discovery is that many plant-feeding species heretofore unknown or innocuous have had their depredations stepped up by the use of some of the new insecticides so that now they are serious pests. Some mites are important to the soil, some are beneficial in controlling other species, both of mites and insects, and some are vectors of rickettsial and virus diseases, as scrub typhus and encephalitis. Because of their very small size yet complex organization, mites have always been a favorite subject for the microscopist.

An introductory chapter discusses the ecology, anatomy, collecting, and mounting of mites. The separate families are then dealt with in detail, with keys, lists of genera and types, line drawings, and bibliographies. The volume is fully indexed and cross-referenced to topics of interest in medicine, veterinary medicine, agriculture, and pest control. This enables the reader to identify any mite and determine its economic status. *Acarology* plugs one of the greatest gaps in modern descriptive zoological literature and will be a must for all interested in entomology and parasitology. Pp. xiii, 465; colored frontisp., pls. 2, figs. 377. The Macmillan Co., 60 Fifth Ave., New York 11, 1952. \$10.00.

Neurology

WHEN we received the second edition of *Fundamentals of Neurology*, by Ernest Gardner, we were fearful lest some of the good points of the first edition, a great favorite of ours, might have been abandoned or altered. But our fears were soon at rest, for we found this fine little book better than ever. There is new material on the cerebral cortex, motor pathways, and nerve conduction and there are 39 new illustrations that form a distinct improvement.

The organization of material in this volume is admirable and the presentation simple and clear, the author succeeding in explaining one of the most involved of all biological subjects in a very readable manner. His summaries, brief biographical sketches, and glossary continue as useful features, while the illustrations are splendid and very important as adjuncts to the text. Pp. xii, 359; figs. 142. W. B. Saunders Co., West Washington Square, Philadelphia 5, 1952. \$4.75.

Genetics

A HANDSOME new text in heredity has been produced by A. M. Winchester, of the John B. Stetson University, called simply *Genetics*. Points that appealed especially to us were the general overall plan and complete coverage, the clear and interesting presentation, inclusion of classical and historical material along with the latest advances in cell chemistry, and the abundant and

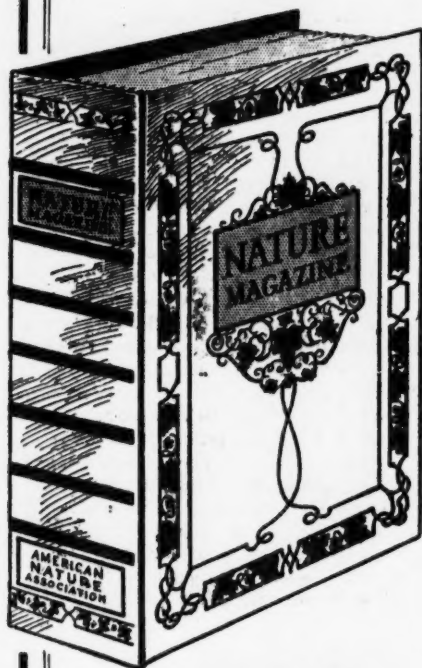
fine illustrations. The author is noted as a biological photographer and many of the excellent photographs are his own work, yet he has not hesitated to go to other sources for particular subjects.

There are 26 chapters, beginning with an introduction that points out what heredity is and what it is not, demolishing common superstitions. There follows the historical development of genetics, basic cytology, Mendelian heredity, the many discoveries of the twentieth century, and the statistical method. Especially clear and valuable is the explanation of giant chromosomes and gene action. Experimental modifications, the relation of gene mutations to evolution, plant and animal breeding, human heredity, and eugenics close the book. This text is intended to attract both the biology major and the non-major, an aim in which we believe Dr. Winchester has succeeded remarkably well. The presentation is always lively and factual, using case histories to develop principles, and interlarding much human genetics to provide maximum interest. Most chapters end with a list of problems to work. The double-column type set makes for handsome appearance and easy reading. Pp. xii, 371; figs. 231. Houghton Mifflin Co., 2 Park St., Boston 7, 1951. \$5.00.

Medical Education

AN EXTREMELY practical little volume, now out in second edition, is *How to Become a Doctor*, by George R. Moon, Examiner and Recorder, University of Illinois Colleges of Medicine, Dentistry, and Pharmacy. In the past twenty years the author has interviewed 20,000 prospective medical students and is easily one of the world's best qualified persons to write such a book. Perusal of the brief chapters quickly leads the reader to see that here is all the essential information to guide the novice's feet from high school through college, medical school, internship, and residency, and that the book is worth its weight in platinum to anyone who plans to pursue a career in medicine, dentistry, veterinary medicine, pharmacy, or other allied fields. The suggestions are intensely practical, do's and don'ts (type your application; don't chew gum), with illustrations from actual cases for each step. You can learn how to select the most appropriate college, the medical school of preference, how to apply, sample aptitude tests, the personal interview, how admissions committees operate, how to study in medical school and the many pitfalls to avoid, social and personal problems, outside employment, securing an internship and a residency. There are special instructions for women, dentists, pharmacists, and others. Complete lists of schools are included. The book is carefully organized and very well written. It fills an important need and we predict for it a long and successful tour of duty. Pp. ix, 131. The Blakiston Co., 575 Madison Ave., New York 22, 1950. \$2.00.

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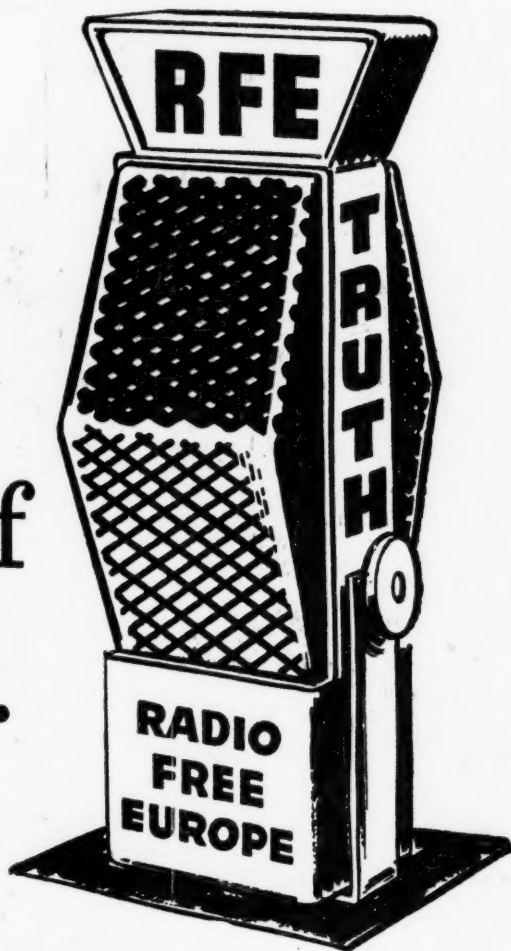
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